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AGRICULTURAL SCIENCES

PEST MANAGEMENT IN POTATO GROWING ON THE BASIS OF CROP ROTATION IN THE WESTERN REGION OF THE AZERBAIJAN REPUBLIC

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Abstract

Use of the integrated plant protection from the modern technologies assumes a significant importance for the agricultural plants productivity increase. Our researches were dedicated to the integrated fight measures for the soil fertility preservation, productivity growth, vermin density reduction in potato sowings of the western region. During the research the various variants of the crop rotation were tested. At this time the crop rotation scheme consisting of the potato bulbs which were stocking up from potato, cabbage, onion, root crop (radish, sugar beet and etc) in spring sowings, but leguminous (bean and etc.), vegetable (cucumber and etc.), orchard plants (water melon, melon, pumpkin and etc) in summer sowings, early plantings and previous year was tested in the fields where the potato is grown. It was determined that growing of the mean early ripening and mean late ripening potato sorts in the spring sowings, but early ripening potato sorts in the summer sowings and under western region condition and at this time use of the five-field crop rotation system are advisable. The perennial grass use is not advisable because of observing the sort structure and population density of the injurious organisms settled in the arable layer and deteriorating some physical features of the arable layer in the formed shift crop rotation depending on the sowing period (early, spring and summer). A bulky weight of the sowing layer in the field where the potato will be grown must be 0,9 - 1,2 g/cm³. One of the following materials must be applied under plants every year: 20 tons of rotted manure, or 5 tons of tree crumb one ton of ash made from the plant remnants.

Keywords: west region, crop rotation system, potato plant, integrated growing technologies

Introduction

The modern development of the human's society is closely connected with the environment problems solution. These problems are available in agriculture, too. The works are performed in different directions to meet the world population's requirements for the agricultural products (Parmesan and Yohe 2003; Vallad and Goodman 2004; Walter *et al.* 2005; Butov 2008; Abrosimova *et al.* 2014). One of such measures is productivity growth. The different pesticides and agrochemical substances are used for the purpose of productivity increase. And this causes contamination of the environment and produced crop. Every year fertilizer more than 300 million tons and pesticide more than 4 million are applied in agro-and biocenosis, this is a reason for balance disorder in biosphere (Delbare and Serradilla 2004; Kudsk 2007; Goncharov 2010).

Our researches show that the following problems exist in potato growing of the western region in Azerbaijan: 1) incorrect definition of the sowing time in vegetative material; 2) not investigating indications as wildness observed in potato bulb, anormal development and etc. by farmers; 3) Denseness of the arable layer during the various agrotechnical measures; 4) Chaotic development of the injurious organisms in agrocenosis; 5) not shooting 60-70% of the buds on the vegetative sowing material (Huseynov *et al.* 2006).

Since the 50th years of the last century these problems began to worry the mankind. The measures were performed in the different countries to prevent from the problem. The realized problems were directed against "Pesticide syndrom". The "integrated" conception was used by R.E.Smit and V.Allen for the first time in 1954

(Fedorenko and Manko 2005). They approached the integrated fight measures as together use of the biological and chemical fight methods. It is necessary to realize an application of the integrated fight measures system in a form of systemic co-ordination scheme (concerning the local condition) of the prognosis, quarantine, agrotechnical, genetical, biological, mechanical, physical and chemical control methods (Dr. Wolfgang and Ullrich 1998; Gerasimova *et al.* 2007; Sonnewald and Sonnewald 2014). Generally, the integrated fight measures - preserving and management of the factors that cause product loss including a development level of the injurious organisms to a degree of not feeling harmful impact. This system local must possess a local feature and must be improved. It is possible to co-ordinate both the fight methods and means which enter the separate fight methods in the integrated fight technology (Shelton 2004; Chulkina *et al.* 2009; Basov 2010). The measures performed in the integrated fight are connected in chain form. From this point of view the elements of the integrated growing technology must be investigated (Easterling and Ellner 2000; Govorov 2007; Afinogenova and Morozov 2011; Gorbunov 2014).

The control methods in the scheme must supplement each other besides they are "equal in rights". If any of the components isn't taken into account during the growing, an influence of other measures can become weaker. Depending on the plant development stage (vegetative sowing material, sprout development, 3,5,7 and etc. leaf stages, blossoming, bulb formation stages) these components create different configurations (quarantine-agrotechnical-genetic-physical-chemical; prognosis-quarantine-agrotechnical-genetic-

biological; agrotechnical-biological-mechanical and etc.) (Agrobiological peculiarities of the field cultures placing in crop rotation 2006; Borin and Korovina 2010).

The integrated fight measures can be divided into six stages (Goncharov *et al.* 2013; Ulyanenko *et al.* 2015):

1. Compiling of the map corresponding to the local condition (exactly indicating the calendar period that will be fulfilled in agroecosis concerning the season).

2. Preparation of the arable layer (cleaning the area from plant remnants and stone, autumn ploughing, definition of the food stuff, being co-ordinating the physical and chemical indications of the arable layer to the potato plant need, doubling tillage, harrowing of the plot, crop rotation or plants shift, revealing the sort structure of the injurious fauna settled in soil and soil pesticide application if it is necessary, organization of the protective stripes).

3. Preparation of the vegetative sowing material (durability against injurious organisms and ecological factors, high productivity, greening the potato bulbs, to pass vernalizing or ozonization, disinfection of the sowing materials and etc.).

4. Definition of the sowing time, norm and scheme (over the early, spring and summer sowings)

5. Performing seasonal growing (loosening of the interrows, filling of the bottom, regulation of the pH in irrigative water, drop watering, disinfection with the microbiological preparations by paying attention to the economic-injurious level or application of the deceptive forage).

6. Investigation of the naturally useful fauna and flora in agroecosis (increase and application of the microbial-antagonists, parasite and wild fauna which act under the local condition, planting the attractant and kayromon or frightened (repellent) plants).

A share of the fight methods was specified in the integrated fight measures system applied in the potato sowings from western region. The quarantine measures were defined 3,0 % quantitatively in the integrated fight measures system. The agrotechnical measures are mostly realized in the integrated fight measures system. This index is 55% and it shows that correct use of the agrotechnical means is one of the main and inevitable elements in the integrated fight measures system. The means including in agrotechnical method minimize injury of the injurious organisms besides creating good condition for the potato plant development. Though the biological means application possesses 6,0 % share, it assumes significance importance in the safety protection of plants ecologically. A share of the chemical fight method was determined 19% in the integrated fight measures system. It is very important to obey the following needs while using from the chemical means. 1) application of the pyrethroid pesticides having selective impact; 2) to pay attention to the economical-harmful level of the injurious organisms; 3) to take a rational number of entomophags or microbial-antagonists into consideration. Though the methods and means including in integrated fight measures system have various share quantitatively they are the same

powerful and can't substitute each other. Therefore, the co-ordinated or combined means of these methods must be rationally used in the potato plant growing.

Methods

Western region is situated in the western part of the Azerbaijan Republic and a total area of the region is equal to 546,7000 hectares. The stationary areas were selected, sowing of the vegetative material was performed in the different periods (early, spring and summer), depending on the height from sea-level (500, 700, 900 and 1400 m) to fix a sowing period of the potato plant.

Development of the plants and injurious organisms was specified depending on height, the observation-calculations were performed in connection with the development of the pests and potato plant in the stationary area. The experiments were applied in the Samukh district (Azerbaijan Scientific Research Institute of Plant Protection and Technical Crops, experimental area -69 m) and the potato sowings (Goygol, Gizilgaya) in the zones till 500 m of height from sea-level according to the method that was adopted in Academic Council of the Institute of Azerbaijan Scientific Research Institute of Plant Protection and Technical Crops to reveal the reasons of the degeneration and anormal development observed in the potato sowings at various heights (Mammadov and Khalilov 2012).

For this purpose Amiri-600 I (from the seed material of the potato sowings grown in the zones till 500 m height from sea level) and Amiri-600-II from the sowing material produced from the same seed in the Gadabay region) were used. The experiments were put two variants, four secondaries in every region. An area of each secondary was taken 250 kv.m. Amiri-600 -I sort was planted in the first variant, but Amiri-600 -II sort was planted in the second variant. The root bulbs of five plants were dug out in four secondaries over each variant (in a direction of the area diagonal in each secondary) and the bulbs in which degeneration and anormal development is observed were gathered corresponding to the versions (Huseynov 2012). According to this number a degeneration percentage of the potato bulbs was specified.

The following terms were fulfilled according to the method adopted in Academic Council of Azerbaijan Scientific Research Institute of Plant Protection to organize a scheme of the potato crop rotation: 1) a sort structure of the pests in the shifting plants mustn't be the same; 2) a need of the plants for the reserve nutrients shouldn't be the same; 3) the selected plants must be profitable for the farmers' budget. 4) the ancestral plants must possess high phytoncide feature; 5) the ancestral plants must rise the plants fertility and improve its structure; 6) gathering of the ancestral plants mustn't be at the same time.

According to the method the ancestral plants were selected corresponding to the season (early, spring and summer) the experiments consisting of two variants were performed. An area of each variant was 0,5 hectares. The potato plant under control version was laid in from the plants grown in the different zones Slavyanka village of Gadabay every year.

Analysis and discussion.

We present the consequences got from the agro-technical measures system application including in the measures system of the integrated growing technology taking into account the article volume. The crop rotation must be applied in order to preserve the soil fertility, population density decrease of the pests (settled in soil and surface) and not to assume negative farming importance by the pests. While applying the crop rotation the following factors must be taken into account (Huseynov 2012):

- 1) the sort structure of the pests in the shifting plants, diseases and weeds should be various;
- 2) the plant need for the reserve nutrients in soil mustn't be the same.
- 3) the selected plants must be profitable for the farmers' budget.
- 4) the ancestral plants must possess high phytoncide features;
- 5) the ancestral plants should possess a short vegetation period;
- 6) the ancestral plants should rise the soil fertility and improve structure;
- 7) the crop harvest of the ancestral plants mustn't be at the same time;

The potato plant is sensitive for the soil-climatic condition and crop rotation. The strong decrease of the productivity is observed while performing continuously sowing (monoculture) even in a high agro technical fund. Therefore, correct placing of the potato plant in crop rotation is very important. On the other hand the monoculture application causes mass development of the injurious organisms. During the research years the experiments about two variants and four secondaries (early, spring, summer sowings) have been applied corresponding to the sowing period for the purpose of the ancestral plants selection (Table 1, 2 and 3).

An area of each variant was taken 1000 (thousand) kv.m. The pants were shifted under the first variant, but the potato plant was used as monoculture under the second variant. In the early sowings the crop rotation system consisted of the potato plant, vegetable plants (cucumber and etc.) leguminous plants (bean and etc) and onion plants (Table 1). In the spring sowings potato, cabbage, onion root crops (radish, sugar-beet and etc) were used (Table 2). But in the summer sowings the crop rotation scheme about the potato bulbs laid in from leguminous plants(bean and etc.), vegetable (cucumber and etc), onion, orchard plants(water-melon, melon, pumpkin) and the previous and early sowings was tested (Table 3).

Table 1.

Grop rotation for the early potato plant

I field	II field	III field	IV field	V field
Potato	Leguminous (bean)	Cucumber	Potato	Onion
Leguminous (bean)	Cucumber	Potato	Onion	Potato
Cucumber	Potato	Onion	Potato	Leguminous (bean)
Potato	Onion	Potato	Leguminous (bean)	Cucumber
Onion	Potato	Leguminous (bean)	Cucumber	Potato

Table 2. Grop rotation for the spring potato plant

I field	II field	III field	IV field	V field
Potato	Cabbage	Onion	Potato	Onion
Cabbage		Potato		Potato
Onion	Potato		Potato	Cabbage
Potato		Potato	Cabbage	Onion
	Potato	Cabbage	Onion	Potato

Table 3.

Grop rotation for the summer potato plant

I field	II field	III field	IV field	V field
Leguminous (bean) + Potato	Orchard plants (water-melon, melon, pumpkin)	Onion	Cucumber +Potato	Garlic+radish
Orchard plants (water-melon, melon, pumpkin)	Onion	Cucumber +Potato	Garlic+radish	Leguminous (bean) + Potato
Onion	Cucumber +Potato	Garlic+radish	Leguminous (bean) + Potato	Orchard plants (water-melon, melon, pumpkin)
Cucumber +Potato	Garlic	Leguminous (bean) + Potato	Orchard plants (water-melon, melon, pumpkin)	Onion
Garlic+radish	Leguminous (bean) + Potato	Orchard plants (water-melon, melon, pumpkin)	Onion	Cucumber +Potato

The carried out researches showed that the crop rotation minimized the soil pests' population density besides increase of the crop rotation productivity. During the crop rotation the ancestral plants have a short vegetation period and this causes ploughing and irrigation of the arable areas for some times in the year, and the soil pests, the injurious organisms spending some development stages in soil expose to mechanical impact (touching the plow, remaining under the tractors drowning in the water) and perish (Table 4). It should

be noted that using from perennial grass in crop rotation isn't expedient. The same fields became a shelter and forage source for the injurious organisms, this rises the soil pests' population density and causes migration to the fields. On the other hand an upper part of the arable layer is watering out and lost. Besides it the technical means turn the arable layer surface into dust and winnow it by wind, this is a reason for compactness of the low layers.

Table 4.

Decrease of the pest's population density in the crop rotation scheme

Variants	Productivity, t/h	Population density of the injurious organisms spending some development stages in soil			
		wire worms	mole cricket	Colorado insect	
				pupa	imago
Early sowing	26	0.3	1.2	2,0	4,0
Control (monoculture)	8,3	0.8	4.2	5,0	9,0
Spring sowing	18	0.5	-	6,0	11,0
Control (monoculture)	7,6	0.9	-	8,0	13,0
Summer sowing	16	0.1	1.1	-	2,0
Control (monoculture)	11,3	0.6	2.6	5,0	7,0

As seen from the tables (1-3) an application of the crop rotation scheme and selection of the plants having short vegetation period, ploughing and irrigation of the arable area for some times in the year causes decrease of the population density of the potato pests. But while applying the crop rotation system the undesirable cases are observed. While using the different technical means the soil particles turn into dust form on the surface of the arable layer and are winnowed by a wind and the deeper layers compaction is observed. On the other hand irrigation by the furrows wash out the reserve nutrients and humus layer, disturb a relation between the soil particles. Therefore, optimization of the physical features possesses a great importance in provision of the potato plant with the water, nutrient and air. The arable layer is granular and it is one of the important terms in soil cultivation.

It is shown in the agro-climatic map of our map that Azerbaijan is a mountainous country. The plain, foothill and mountainous zones of the Gazakh, Aghstafa, Tovuz, Shamkir, Gadabay, Dashkasan, Goygol, Ganja, Samukh, and Goranboy are included in western region. The dark grey-brown, grey-brown, bright grey-brown, meadow-grey -brown, flood-land meadow, boggy meadow, steppe mountain grey, mountain-black, steppe mountain forest, calcareous, mountain steppe-brown, steppe mountain forest brown soil types and subtypes spread in the region. There is solonchification and salinization in the region. From the soil sorts and variety the clayey, heavy loamy, mean loamy, light loamy, weak salinization, weak solonchified, mean solonchified, sandy, weak erosion, mean erosion sorts are observed. The references show that humus quantity in such soils changes by 1,2-9,4 %,

nitrogen -0,054% -0,565, phosphorus-0,07 -0,16 %, potassium 1,36 -3,5%, this is good for the potato plant development. But the potato plant productivity, potato bulbs measurement and other indices lag behind the quality and quantity indications of the product grown in the arable areas applied the organic fertilizers.

To investigate its reason, a quantity of the microelements in composition of ash, manure and peat was specified. It was known that nitrogen is 0,5%, potassium-0,6%, phosphorus -0,2% in rotted manure. These indices in the soil are correspondingly: 0,3-0,9% nitrogen, 0,03- 1,0% potassium, 0,5 -1,2 % phosphorus. Potassium in ash is on average 8,4-40%, phosphorus -2,0 -7,3 %. A quantity in soil and atmospheric air is approximately the same. It should be noted that the potato plant appropriates 120 -150 kg of nitrogen, 60 -75 kg of phosphorus, 240 -300 kg of potassium, 40 kg of calcium, 15 kg of magnesium from one hectare of arable layer during the season. All the substrates (exception nitrogen in ash) are good for the potato plant development. But during the crop harvest the potato bulbs measures are larger in manure, ash (when nitrogen is shortage) than in soil. One of the factors preventing from the potato plant development is majority or minority of the arable layer capacity. When this index is unfit for the potato plant the productivity abates. The arable layer bulky weight changes depending on soil type (60).

The experiments about five variants in the early potato sowings were applied in the Gizilgaya settlement of Goygol during the research years of 2013-2022 to specify a change of the root bulbs and development depending on the environment factors (bulky weight of

soil, porosity, aeration). Under the first variant the vegetative sowing material (Nevskiy) was planted in the arable area enriched with the combined $N_{90} P_{120} K_{60}$, under the second version in the arable layer where $N_{90} P_{120} K_{60}$ and 20 tons of rotted manure were applied, under the third variant the ash laid-in from the one ton of the burnt plant remnants calculation, the area in which 20 tons of rotted manure and $N_{90} P_{120} K_{60}$ were applied. Under the fourth variant 20 tons of rotted manure, five tons of chopped chaff or grapevine and $N_{90} P_{120} K_{60}$ were applied per hectare. But under the control version the potato bulbs were planted into the arable layer (soil) where the nutrients weren't added. The agrotechnical measures under all the variants were performed in optimal time and in the same rule. At the end of the season the measures of the potato bulbs and productivity were defined over the variants (Table 5).

The researches showed that the potato plant productivity and their bulb measures change depending

on a bulky weight of the arable layer (substrate) and aeration. Over the versions the productivity was accordingly 20; 46,8; 49; 48,3 and 16 tons hectare. There are potato bulbs with a large measure in the second, third and fourth variants. Being higher of the productivity and potato bulb measures in the second, third, fourth variants in comparison with the control prove that fitness of the bulky weight and porosity of the arable layer besides the reserve nutrients in the areas where the potato will be planted is very important. One of the important factors which will be noted is that development and productivity of the plants were higher in comparison with the other variants, though minority or absence (absence of nitrogen in ash) of the nutrients in rotted manure and ash in comparison with the mineral fertilizers and soil layer. Its reason is that the manure and ash aren't compacted during the season. The airing process and bulbs growing occur quickly in the compact soil.

Table 5.

Influence of the bulky weight of the arable layer and aeration on potato plant productivity and root bulb measures during the season (Goygol district, Gizilgaya settlement, 2013-2022)

N/N	Variants	Sec-ond-aries	Bulky weight of the arable layer, g/cm ³	Productivity, ton	Additional-crop, ton	Bulbs parameters, cm (a measure of 100 potato bulbs on average under each variant)
1	$N_{90} P_{120} K_{60}$	4	1,2-1,3	20,0	4	16,2- 18,0
2	20 tons of rotted manure+ $N_{90} P_{120} K_{60}$	4	1,0-1,1	46,8	30,8	23,4- 34,8
3	1 ton of ash+20 tons of rotted manure+ $N_{90} P_{120} K_{60}$	4	0,9-1,0	49,0	33,0	25,0- 38,2
4	20 tons of rotted manure + 5 tons of chopped chaff (grapevine) + $N_{90} P_{120} K_{60}$	4	0,9-1,0	48,3	32,3	24,6- 37,9
5	Control	4	1,2-1,4	16,0	-	11,5- 21,2

So, the main factors influencing on gas exchange between soil layer and atmosphere are precipitations, temperature and pressure. As the soil air regime improve its physical characters, positively influence on biological action the agrotechnical measures (application of organic fertilizers, ash, chopped chaff, grapevine and etc., loosening interrows, filling the bottom) can regulate this process. This influences on normal development and constant productivity of the plants. Therefore creation of the fit air regime that is a necessary term of the soil fertility, co-ordinating the bulky weight to the plant need are important for the arable layer. We can come to such a conclusion that the potato bulb measures depends on its bulky weight, porosity, richness with organic substances and airing regime besides the arable layer fertility. The porosity in soil improves an aeration process this causes fast growing of the bulbs.

Conclusion

1. The researches show that growing the rapid-ripening potato sorts in the early or summer sowings, mean rapid-ripening and mean late-ripening potato sorts in the spring sowings is expedient. The agrocenosis in which the late-ripening potato sorts expose to the negative effect of the ecological factors, this rises a capacity of the crop loss, increases the product prime cost.

2. The plants which can complete their development for a short period must be grown in the potato crop rotation system. Especially, it is impossible to use from perennial plants, because the soil pests develop, migrate to the same areas and neighbour fields and injure them, though the productivity is higher in the arable areas where the perennial grass is grown. Rationality of using the five-field crop rotation system in the potato crop rotation system was determined crop rotation of the potato, cabbage, onion, root-crop (radish, sugar beet) in spring sowings, leguminous (bean and etc), vegetable (cucumber and etc) in summer sowings, onion, orchard plants (water melon, melon, pumpkin) and potato root bulbs. During the crop rotation or application of the plants shifting the rationality of the selected plants besides their biological, agrotechnical characters must be taken into account.

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CULTIVATION TECHNOLOGY OF WINTER WHEAT IN THE GANJA-KAZAKH REGION**Guliyeva R.K.,
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[DOI: 10.5281/zenodo.7747148](https://doi.org/10.5281/zenodo.7747148)***Abstract**

Winter wheat is demanding against predecessor plants. The main requirement for the predecessors is that the field is cleared of plants in time for cultivation and sowing, it is possible to clean the field from weeds, it is possible to collect and preserve moisture and, on the basis of this, to ensure the same level of output, the plants develop well in autumn. Doing it will make it possible to have a good wintering and get a high yield. Black herring is the best predecessor for winter wheat in arid, dry regions. On irrigated and moisture-provided soils, winter wheat is planted with potatoes, annual cereals, corn for green fodder, alfalfa, rapeseed, sorghum, etc. they are good predecessors. The main requirement for the predecessors is that at least 30-45 days before the sowing of autumn crops, the field is free and can be fertilized and plowed. [2, pp194-195]

Keywords: winter wheat, cultivation technology

Should be applied according to the biological characteristics of each variety and the soil-climatic conditions of the region where it is cultivated. Cultivation of the soil should be zonal in nature, should protect the soil from erosion, should be aimed at collecting and preserving moisture. Cultivation of the land with the method of kefiy fiyyat affects the moisture of the planting layer, littering with weeds, which shows the effect of obtaining good outputs and increasing productivity. In the vegetable garden, spring and autumn annual legumes, corn, potatoes, beets, tobacco, cotton, etc. can be cultivated. High agrotechnical care of each plant cultivated in such a field, their harvest should be done quickly, and the field should be plowed and prepared for sowing approximately 35-40 days before winter wheat sowing. In many farms, wheat is sown again instead of winter wheat or barley. In this case, it is necessary to pay more attention to the preparation of the field for sowing. If there is enough moisture in the soil at the time of harvesting the predecessor plant and the field is free of weeds, when harvesting the crop, it is necessary to plow 28-30 cm in the field behind the combine, and immediately trowel and smooth it. After that, it is necessary to carry out cultivation and harrowing to destroy the weeds formed in the field before sowing. Before plowing, 10-15 tons of semi-rotted manure and 1.5-2 centners of superphosphate should be given per hectare. If there are a lot of weed sprouts in the field and the soil is dry, it is recommended to cover the corner with LDQ-10 and LDQ-15 brand disc or slatted cultivators immediately behind the combine harvester at a depth of 5-7 cm, as soon as wheat or barley, which is the predecessor plant, is harvested. If there is a lot of littering with root-loving weeds in the field, it is important to carry out mulching at a depth of 10-12 cm with PPL-5-25, PPL-10-25 plum mulchers. In order to create good conditions for the germination of weeds and ensure quality plowing, it is very important to apply water (deceptive irrigation) at the rate of 500-600 m³ per hectare after covering. 3-4 weeks after seeding, when weeds germinate, plowing is carried out at a depth of 25-30

cm with PLN-6-35, PTK-9-35 brand plows. In the spring, in order to prevent the loss of moisture in the herik field, plowing is carried out with the BZTS-1.0 brand aggregate, then during the whole summer, cultivation is carried out with the KŞP-8, KPS-4 brand aggregates up to 3-5 times as weeds form. The first cultivation is carried out at a depth of 10-12 cm, each subsequent one is shallower than the other, and the cultivation before the last sowing is carried out at a depth of 5-6 cm. This type of cultivation ensures that moisture is retained in the soil and the field remains free of weeds. RVK-3,6, RVK-5,4, VIP-5, combined aggregates are used for better cultivation before sowing. In one run of the unit, the soil is softened, the clods are crushed, the soil is tamped and the microrelief is smoothed. For better soil compaction, harrowing gives good results, it is efficient to use APK-2.5, APK-5.0 combined (ring-shaped harrow and trowel, cotton, tractor) plowing units on soils with sufficient moisture. After the harvest of the predecessors, there is usually little time (time) left until the sowing of autumn crops, so it is necessary to carefully choose the soil cultivation system for autumn crops. If it is more than a month before sowing after the harvest of the predecessor plant, then the field is immediately covered and soon plowed with mulching, or plowed without covering. If there is less than a month left after the harvest of the predecessor plant, then in dry air and weed-free fields, the surface cultivation of the soil is applied at a depth of 10-12 cm, and harrowing is applied. The field is weedy, when the soil is dry, the ridge is covered with a disc trowel to a depth of 5-6 cm. Then the field is irrigated at the rate of 500-600 m³/ha. After the seeds of grain and weeds have germinated, re-covering is done and the plow is lifted. Cultivation and trowel are applied to the field if necessary until sowing. The field is plowed, sowing is carried out immediately after pre-sowing cultivation. After sowing, furrow irrigation is carried out in non-ploughed areas.

Application of fertilizers is one of the important agrotechnical measures that ensure abundant and high-quality harvest. Fertilization system should ensure:

planned high-quality grain harvest; increasing soil fertility; environmental protection; purchase of biologically pure products; high efficiency of fertilizers. Fertilization system should be adjusted so that the balance of nutrients in the soil is positive, regardless of the predecessor plant. Winter wheat takes 25-35 kg of nitrogen, 19-30 kg of phosphorus and 13-20 kg of potassium elements from the soil with each ton of main and additional products. In order to ensure the high efficiency of mineral fertilizers, it is necessary to carry out liming so that the reaction of the soil product is close to neutral (pH-7.0) in fields with acidic soil. Fertilization system for winter wheat consists of putting the soil under the main plow during the main cultivation: under cultivation before sowing ; in rows, or in rows-with sowing during sowing; in the form of feeding during the vegetation period of the plant. Under winter wheat, manure, peat, compost, phosphorus and potassium fertilizers are used as the main fertilizers. Manure is the most valuable fertilizer for all regions where winter wheat is grown . If winter wheat is placed after clean heather, organic fertilizer is given under the plow in autumn, and in black heather, it is applied to the plant occupying the field or directly under winter wheat. When applying organic fertilizer, it should be taken into account that 1 ton of cattle manure contains N-0.5 kg, P₂O₅-2.5 kg, K₂O-0.6 kg (the first year, respectively, 20-30 , 25-36 and 50-60% are used).

Phosphorus and potassium fertilizers are applied under the main plow. A part of the phosphorus fertilizer in the form of granulated superphosphate (15-25 kg P₂O₅ per hectare) is given to the rows with a grain spreading layer. If phosphorus and potassium fertilizers were not given during the main cultivation of the soil, or if they were given in small amounts, then they can be given under cultivation before sowing. For winter wheat, N₉₀ P₉₀ K₆₀ kg per hectare can be considered as a good norm (including active substances). Fertilizer rate in a specific region should be calculated on the basis of soil and plant diagnostics based on the balance method. As a rule, the annual rate of phosphorus and potassium should be given under the main plow. 20 kg of phosphorus fertilizer should be applied to the rows locally (in a certain area near the row) to increase the winter-hardiness of winter wheat . Each kg of phosphorus given to the row gives an increase of 15-16 kg. Adding micronutrients boron, manganese, zinc, molybdenum and cobalt to the rows along with sprinkling makes it possible to supply the seedlings with qi and elements, and they quickly form a root system and develop well. When feeding with superphosphate in autumn during the bushing phase, the plant's root system and leaves are well formed and they are more resistant to adverse winter conditions. [3, p. 89-92]

Nitrogen fertilizer should be applied in portions. When winter wheat is placed after pure heather, cereal-legumes and perennial leguminous fodder grasses, nitrogen fertilizer is not given in autumn, but it is used in the form of spring feeding. 20% of the annual norm of nitrogen should be given under cultivation when the soil is cultivated before sowing, 50-60% should be given as feeding fertilizer in early spring, and 20-30% should be given in the phase of sprouting-spiking. In addition, in order to increase the amount of protein and gluten in the grain and to obtain strong wheat, nitrogen fertilizer should be given in the form of extra-root feeding at the rate of 30-40 kg of active substance per hectare in the spike-graining phase. Nitrogen is more abundant in winter wheat during the tillering and tillering phase . In crops that are well developed and wintered in favorable conditions, 40-50% of the total rate of nitrogen is given as the first feeding at the end of the bushing and at the beginning of the tuber . During this period, when nitrogen nutrition is normal, bushing is better, the spike develops well, and the number of fertile spikelets in the spike increases. Since the plant mainly needs nitrogen element more in spring, development starts early and the number of productive stems increases. In the first spring feeding, it is necessary to take into account the plant density in the crops. In sparse crops (300 plants per 1 m²), the dose of nitrogen is increased by 10-20 kg per hectare, but in dense crops (more than 400 plants per 1 m²), the dose of nitrogen is reduced by 10-20 kg per hectare. The second feeding is given up to 40-50% of the total norm in the weaning phase [1, p.109-112].

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CHEMICAL SCIENCES

ABOUT PROPYLENE COMPOSITE PROCESSING

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О ПЕРЕРАБОТКЕ КОМПОЗИТОВ НА ОСНОВЕ ПРОПИЛЕНА

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Abstract

In the article, the influence of the temperature regime and pressure of melt extrusion in a material cylinder on the physical and mechanical properties of propylene-based composites was studied. The optimal conditions for the processing of multicomponent composites are shown.

Аннотация

В статье исследовали влияния температурного режима и давления экструзии расплава в материальном цилиндре на физико-механические свойства композитов на основе пропилена. Показаны оптимальные условия переработки многокомпонентных композитов

Keywords: polyolefin, composite materials, processing

Ключевые слова: полиолефин, композиционные материалы, переработка

По мере того, как развиваются такие отрасли промышленности, как машиностроение, приборостроение, судостроение, авиационная и космическая техника и т.д. все более жесткие требования стали предъявляться к качеству конструкционных изделий получаемых на основе полимерных материалов. С целью улучшения качественных показателей выпускаемых в промышленности полимеров в их состав вводят пластификаторы, наполнители,

стабилизаторы, составляют смеси различных полимеров в определенных комбинациях и т.д.. Изменение структуры и свойств полимерных материалов осуществляют обычно в процессе механо-химической модификации на экструзионном оборудовании, смешением на вальцах или же непосредственно в процессе монотрем технологии на литьевой машине. Преимущество монотрем- технологии заключается в смешении компонентов и получении

изделия по однопроходной схеме, т.е. в едином технологическом цикле. Согласно этой технологии после сухого перемешивания компонентов, последние направляются в бункер литьевой машины для дальнейшего перемешивания в режиме расплава и получения изделия на основе композиционного материала. Следует при этом отметить, что в литературе приводятся весьма скудные сведения относительно влияния условий переработки композиционных материалов на их физико-механические и, в особенности, на трибологические свойства. Именно от условий правильного выбора температурного режима переработки в материальном цилиндре литьевой машины и охлаждения изделия в прессформе зависит формирование надмолекулярной структуры и соответственно качественных характеристик композитов [1-8].

В связи с этим, целью данного исследования являлось изучение закономерности изменения основных физико-механических, технологических и трибологических характеристик композитов в процессе переработки методами литья под давлением и экструзии.

При изучении процесса смешения и переработки наполненных полимерных композитов немаловажное значение приобретает выбор оборудования. Как правило, наиболее оптимальным является использование двухшнековых экструдеров, способствующее практически равномерному диспергированию наполнителя в объеме полимерной матрицы. В рассматриваемом случае для проведения механо-химической модификации и получения изделия по моноотрем технологии, на наш взгляд, наиболее перспективным является проведение переработки на универсальной одношнековой литьевой машине. Такая конструкция литьевой машины позволяет производить не только тщательное термомеханическое перемешивание полимерных композитов, но и

одновременно проводить в ней механо-химическую модификацию. Механо-химическая модификация характеризуется тем, что в процессе перемешивания смеси полимера с минеральным наполнителем, представляется возможным получить наполненные композиционные материалы со сравнительно равномерным диспергированием твердых компонентов в полимерном объеме. Регулируя температурой материального цилиндра, давлением впрыска и температурой прессформы представляется возможным в определенной степени изменять физико-механические и технологические характеристики композитов. Универсальность этого оборудования заключается в том, что после разогрева полимерной массы процесс смешения сопровождается не только вращением шнека, но и частичным поступательным перемещением шнека, в результате которого создается необходимое давление в момент впрыска в прессформу [9].

В таблице приводятся результаты исследования свойств композита из пропилен глины и сульфида молибдена (ПП+5%масс. глина+5%СМ) в зависимости от температурного режима литья под давлением. Выбор данного композита был обусловлен тем, что именно при таком соотношении рассматриваемых компонентов наблюдаются достаточно обнадеживающие данные по одному из основных показателей - износостойкости. Так, например, если для исходного ПП износ в первом цикле составил 134.55 мг, то для рассматриваемого композита значение этого показателя снизилось до уровня 21,32мг, т.е в 6.3 раза. При этом важно было выяснить, как отразится данный состав композиционного материала на изменении других физико-механических характеристик в зависимости от технологических условий их переработки.

Таблица.

Влияние температурного режима и давления литья на свойства композитов на основе ПП+5% масс. КТГЛ+5%СМ.

Температура по зонам, °С	Давление литья, МПа	Разрушающее напряжение, МПа	Относительное Удлинение, %	Усадка, %	Износ после первого цикла, мг
150-160-170-180*	50	32.5	50	0.45	26.53
150-170-180-190*		31.0	50	0.45	25.12
150-170-185-200*		31.0	54	0.43	25.40
150-170-190-210*		32.6	65	0.41	25.86
150-160-170-180*	100	32.3	50	0.32	24.61
150-170-180-190*		33.2	60	0.32	25.07
150-170-185-200*		33.6	60	0.30	24.19
150-170-190-210*		34.1	70	0.30	23.32
150-160-170-180*	150	32.5	60	0.15	24.21
150-170-180-190*		34.5	70	0.12	23.35
150-170-185-200*		35.5	70	0.09	21.32
150-170-190-210*		35.5	80	0.09	21.48

Сопоставляя данные в этой таблице можно заметить, что давление литья и температурный режим материального цилиндра оказывают определенное влияние на свойства композиционного материала. Становится очевидным, что по мере повышения температуры материального цилиндра

и давления литья происходит закономерное возрастание разрушающего напряжения композита. Есть основание полагать, что в результате роста температуры наблюдается уменьшение вязкости полимерной матрицы, в результате которого возрастает

вероятность равномерного диспергирования частиц наполнителей в объеме полимерной матрицы. С одной стороны, рост температуры и давления литья способствует повышению текучести расплава полимерной массы и соответственно более быстрому и полному заполнению прессформы. С другой, частицы глины и СМ, имея развитую поверхность контакта с полимерной матрицей, еще в процессе термофлуктуационного воздействия и смешения в материальном цилиндре способны к дополнительному созданию гетерогенных центров зародышеобразования. Последние в результате кристаллизации и спонтанного роста кристаллических образований в относительно холодной прессформе способствуют формированию мелкосферолитной надмолекулярной структуры. В итоге, согласно данным таблицы рост температуры и давления литья сопровождается повышением разрушающего напряжения и, в некоторой степени, относительного удлинения композита.

Как и следовало ожидать, с повышением температуры и давления литья наблюдается определенное снижение объемной усадки композита. Снижение объемной усадки является весьма важным моментом, поскольку позволяет исключить возможность существенного изменения объемных и линейных размеров изделия в процессе эксплуатации в различных областях техники.

При оценке количественного изменения износа композита от вышеуказанных факторов переработки мы исходили из понятия о том, что при прочих равных условиях величина этого показателя зависит преимущественно от их плотности и твердости [9]. Иными словами, чем выше плотность одного и того же материала, тем больше должна быть его износостойкость. И действительно, при относительно низкой температуре (150-160-170-180°C) и низком давлении (50МПа) было установлено, что плотность композита составляет 953 кг/м³ и, наоборот, при высоком давлении (150 МПа) и температуре переработки 150-170-190-210°C его плотность становится равным 961 кг/м³.

Анализируя данные в таблице можно заметить, что с увеличением температурного режима и давления литья наблюдается некоторое снижение износа, что, как было показано выше, по-видимому, может быть связано с повышением плотности композиционного материала. Кроме того, следует принять к сведению и то обстоятельство, что глина имеет в своем составе наноглину, которая, как известно, характеризуется слоистой структурой во многом предопределяющей улучшение износостойкости и реологических характеристик. Так, например, при самом низком давлении и пониженном температурном режиме литья износ после первого цикла составляет величину 26.53 мг. При самых высоких

значениях давления и температурного режима литья износ составил 21.48 мг, т.е. снизилась на величину 4.05 мг, т.е. в 1.2 раза [9].

Таким образом, на основании вышеизложенного можно констатировать, что на свойства композитного материала влияет не только состав и соотношение компонентов смеси, но и технологические аспекты их переработки методом литья под давлением. Установлено, что с увеличением температурного режима материального цилиндра в установленных пределах и повышением давления литья сопровождается некоторым повышением разрушающего напряжения сдвига и заметным снижением износа образцов композита. Наиболее оптимальные условия по времени выдержки под давлением составляет 10 секунд.

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ECONOMIC SCIENCES

LEAN CONSTRUCTION: MAXIMIZING VALUE AND MINIMIZING WASTE

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БЕРЕЖЛИВОЕ СТРОИТЕЛЬСТВО: МАКСИМИЗАЦИЯ ЦЕННОСТИ И МИНИМИЗАЦИЯ ОТХОДОВ

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Abstract

Construction is a complex process that involves many different resources, including labor, material, time, and money. Inefficient use of these resources can lead to increased costs, delays, and reduced quality. Lean construction is a modern approach to project management and construction that aims to maximize value while minimizing waste. In this article, we will discuss the principles and benefits of lean construction and how it can be applied in the construction industry.

Аннотация

Строительство — это сложный процесс, который включает в себя множество различных ресурсов, включая труд, материалы, время и деньги. Неэффективное использование этих ресурсов может привести к увеличению затрат, задержкам и снижению качества. Бережливое строительство — это современный подход к управлению проектами и строительству, который стремится максимизировать ценность, минимизируя отходы. В этой статье мы обсудим принципы и преимущества бережливого строительства и как его можно применять в строительной отрасли.

Keywords: lean construction, continuous improvement, waste elimination, last planner system, productivity improvement, quality improvement, collaboration, United States, Japan, Australia, Canada, United Kingdom, Construction industry.

Ключевые слова: бережливое строительство, постоянное улучшение, ликвидация отходов, последняя система планирования, повышение производительности, улучшение качества, сотрудничество, Соединенные Штаты, Япония, Австралия, Канада, Великобритания, строительная индустрия.

Принципы бережливого строительства основаны на идее, что ценность может быть максимизирована путем снижения отходов. На производствах выделяют до восьми видов потерь, хотя никто не ограничивает фантазию по поводу умножения их

номенклатуры. На рисунке 1 представлены все 8 видов потерь, с которыми может столкнуться любое производство. Бережливое строительство стремится устранить эти отходы, оптимизировав процессы, снизив затраты и повысив эффективность.



Рис. 1. Виды потерь на производстве

Один из ключевых принципов бережливого строительства — это вовлечение всех заинтересованных сторон в процесс строительства, от проектирования до доставки. Сотрудничество между дизайнерами, подрядчиками и владельцами является необходимым, чтобы гарантировать, что все работают на достижение общих целей. Бережливое строительство также подчеркивает использование технологий, таких как моделирование информации о здании (BIM), чтобы улучшить коммуникацию и координацию между заинтересованными сторонами.

Преимущества бережливого строительства многочисленны, включая снижение затрат, улучшение качества и ускорение сроков выполнения. Устранение отходов и повышение эффективности позволяет сократить затраты и повысить прибыльность строительных компаний.

Одной из основных концепций бережливого строительства является сокращение «мусора» на стройплощадке. Это включает в себя не только материальные отходы, но и временные потери и простои оборудования. Сокращение мусора помогает уменьшить затраты на его вывоз и обработку, а также увеличить производительность работ.

Важным элементом бережливого строительства является использование принципа «потока».

Это означает, что материалы и оборудование должны поставляться на стройплощадку только тогда, когда они действительно нужны для выполнения работ.

Бережливое строительство – концепция, которая находит свое применение во многих странах мира. Она основана на идее устранения всех видов потерь на каждом этапе производства, чтобы достичь максимальной эффективности использования ресурсов. В этой статье рассмотрено применение бережливого строительства в нескольких странах и сравним его ситуацию в России.

Япония является родиной бережливого производства, и этот подход применяется не только в автопромышленности, но и в строительстве. Возникла данная система как интерпретация идей производственной системы компании Toyota при исследовании её феномена, когда автопроизводитель, ранее выпускавший низкокачественные автомобили, вышел на передовой план в мировом автопроме и пытался обогнать всех своих американских конкурентов. Вскоре суть интерпретации наложилась на уже существующие понятие «шесть сигм» и получилось «lean+6 sigma». Данные сигмы изображены на рисунке 2.



Рис. 2. Lean+ 6 sigma

В данной концепции выделяются определенные принципы, с помощью которых упрощается решение проблем, связанные с ресурсами и их эффективным использованием:

- 1) определение того, что создает ценность продукта с точки зрения конечного потребителя;
- 2) определение всех необходимых действий в цепочке производства продукции и устранение потерь;
- 3) перестроение действий в цепочке производства таким образом, чтобы они представляли собой поток работ;
- 4) создавать только то, что необходимо конечному потребителю.
- 5) стремление к совершенству за счет постоянного сокращения ненужных действий.

В строительстве Японии бережливое производство применяется для улучшения процессов, связанных с проектированием и строительством зданий, а также для повышения качества и безопасности проекта. Например, японские компании используют технологии, которые позволяют сократить количество материалов, необходимых для строительства зданий, таких как легкие и прочные композитные материалы. Они также стремятся к оптимизации использования ресурсов, например, путем переработки отходов демонтажа.

В США концепция бережливого строительства получила широкое распространение в 1990-х годах, когда была создана организация US Green Building Council (USGBC), которая разработала стандарты LEED (Leadership in Energy and Environmental Design) для оценки эффективности зданий с точки зрения экологической устойчивости и энергоэффективности.

Согласно стандартам LEED, здания должны соответствовать ряду требований, таких как использование экологически чистых материалов, повышение энергоэффективности зданий, использование солнечных и ветровых систем энергоснабжения, управление отходами и т.д.

Существует множество компаний в США, которые успешно применяют концепцию бережливого строительства, такие как Turner Construction, Skanska USA и другие. Как и в Японии, главным принципом Lean Construction является устранение потерь на всех этапах процесса строительства. Это может быть достигнуто путем улучшения коммуникаций и сотрудничества между всеми участниками проекта, а также с помощью использования новых технологий и инноваций в проектировании и строительстве зданий.

В Европе концепция бережливого строительства также активно развивается. В Великобритании, например, появилась организация Lean Construction Institute UK, которая занимается продвижением этой концепции в строительной отрасли. Компании, такие как Mace, Balfour Beatty и Laing O'Rourke, также применяют Lean Construction в своих проектах.

Одним из примеров успешного внедрения бережливого строительства является строительство Лондонской олимпийской деревни в 2012 году.

Была создана команда, которая работала по принципам бережливости и использовала инструменты, такие как система последнего планировщика и система доставки материалов «без отходов». В результате была достигнута высокая эффективность, качество и снижение затрат на 15%.

Германия - еще одна страна, активно внедряющая методы бережливого строительства. Страна известна своими высокими стандартами инженерии и строительства, и принципы бережливости естественным образом соответствуют достижению этих стандартов. В Германии был создан Германский институт бережливого строительства (GLCI) в 2011 году, чтобы продвигать принципы бережливости в строительной отрасли. Он предоставляет обучение и консультационные услуги компаниям и организациям, желающим внедрить принципы бережливости.

Один из ярких примеров бережливого строительства в Германии — это концертный зал Эльбфилармония в Гамбурге. Проект изначально столкнулся с перерасходом средств и задержками, но использование принципов бережливости помогло изменить ситуацию. Благодаря внедрению совместного подхода и фокусировке на непрерывном улучшении, проект смог выйти на правильный путь и был завершен в срок и в пределах бюджета.

В отличие от этого, принципы бережливого строительства не так широко используются в некоторых других странах. Например, в Индии строительная отрасль все еще в основном традиционна в своем подходе. Однако есть признаки того, что это начинает меняться. Индийский совет зеленого строительства (IGBC) запустил программу под названием «Зеленые города IGBC», которая направлена на продвижение устойчивых и зеленых строительных практик в стране. Принципы бережливого строительства естественным образом соответствуют этим типам проектов, и возможно, что мы увидим больше принятия принципов бережливости в строительной отрасли Индии в ближайшие годы.

Бережливое строительство в России становится все более популярным и активно применяется в различных сферах, включая жилищное строительство, коммерческую недвижимость, промышленное строительство и другие. Бережливый подход позволяет снизить затраты, повысить эффективность процессов и улучшить качество работ.

В проекте ЖК «Полянка/44» в Москве были использованы передовые технологии и материалы, такие как панели с утеплителем из минеральной ваты, двухкамерные стеклопакеты с низкоэмиссионным покрытием, водосберегающие краны и т.д. В результате удалось сократить расходы на коммунальные услуги и повысить комфорт жильцов.

Еще один проект, который был основан на принципах бережливости это Офисный комплекс «Башня Федерации» в Москве. Строительство включало в себя использование экологически чистых материалов, таких как стекло с низкоэмиссионным покрытием, вентиляционные системы с рекуперацией тепла, энергоэффективные системы

освещения и т.д. Благодаря этому удалось снизить потребление энергии на 40% по сравнению с аналогичными зданиями.

Резюмируя все вышесказанное, бережливое строительство в России активно развивается, и все больше компаний начинают применять его принципы в своих проектах. Однако, для того чтобы масштабировать этот подход, необходимо проводить активную работу по пропаганде и обучению участников строительных проектов, а также создавать более благоприятные условия для внедрения.

Несмотря на различия в терминологии и методах применения, концепция бережливого строительства является всеобщей и на данный момент в ней заинтересовано большое количество стран.

Однако, несмотря на успехи, внедрение бережливого строительства не является простым процессом. Необходимо изменить подход к управлению проектами и обучить сотрудников новым методам работы. Кроме того, внедрение бережливого строительства требует внимания к деталям и постоянной работы над улучшением процессов.

В целом, бережливое строительство становится все более популярным во всем мире, поскольку компании стремятся повысить эффективность своей работы и улучшить результаты проектов. Различные страны внедряют бережливые принципы в соответствии с их потребностями и культурой, но в целом, они стремятся достичь общей цели - улучшить производительность, качество и снизить затраты через постоянное улучшение и сотрудничество.

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HISTORICAL SCIENCES

TSARIST AND SOVIET POLICY OF TURNING NAGORNO-KARABAKH INTO A COMFORT ZONE FOR ARMENIANS (BASED ON HISTORICAL DOCUMENTS)

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ЦАРСКАЯ И СОВЕТСКАЯ ПОЛИТИКА ПРЕВРАЩЕНИЯ НАГОРНОГО КАРАБАХА В ЗОНУ КОМФОРТА АРМЯН (НА ОСНОВЕ ИСТОРИЧЕСКИХ ДОКУМЕНТОВ)

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*Dedicated to the blessed memory of all the martyrs of Azerbaijan.
Светлой памяти всех шехидов Азербайджана посвящается.*

Abstract

Armenian chauvinistic forces, in all periods of history, went to all extremes in order to achieve their cherished goal - the creation of "Great Armenia", a state that did not exist, does not exist and cannot be on the political map of the world. At the same time, all the facts, starting from the 18th century, prove the participation of tsarist Russia and Soviet diplomacy in this dirty Armenian policy. The resettlement of Armenians to the Caucasus, the creation of the Armenian region, the events of 1905-1906, the tragic March events of 1918, the falsification of historical documents - all this was the main direction of the Armenian bandit leadership in Azerbaijan before the forcible establishment of Soviet power in the Caucasus. Although, we note that after Sovietization, this policy was not only not suspended, but, on the contrary, took on a new dimension. The deliberate transfer of Zangezur to Armenia (without the consent of the Azerbaijani people), the deportation of Azerbaijanis from their native lands - all these events are a vivid example of the cabinet games of the Soviet government.

Аннотация

Армянские шовинистические силы, во все периоды истории, шли на все крайности, чтобы достичь своей заветной цели – создания «Великой Армении», государства, которого не было, нет и не может быть на политической карте мира. При этом все факты, начиная с XVIII века, доказывают, участие царской России и советской дипломатии в этой грязной армянской политике. Переселение армян на Кавказ, создание армянской области, события 1905-1906 гг., трагические мартовские события 1918 года, фальсификация исторических документов - все это основное направление армянского бандитского руководства в Азербайджане до насильственного установления советской власти на Кавказе. Хотя, отметим, что после советизации эта политика не только не была приостановлена, а наоборот приняла новый размах. Умышленная передача Зангезура Армении (без согласия азербайджанского народа), депортация азербайджанцев с их родных земель – все эти события яркий пример, кабинетных игр советской власти.

Keywords: tsarist government, Soviet power, falsification, historical documents, deportation.

Ключевые слова: царское правительство, советская власть, фальсификация, исторические документы, депортация.

Введение

В статье говорится о бредовой идее армян создать «Великую Армению» от моря до моря, раскрывается их грязная политика по отношению к азербайджанскому народу.

Итак, на протяжении огромного периода истории армяне претендуют на создание «Великой Армении», государства, которого не было в истории. Не секрет, что эти стремления армян стали возможными уже во времена царской России. Постепенное

ослабление Османской империи стало благоприятной почвой для интенсификации вражеских сил на исторических азербайджанских территориях, с целью создания своего государства, - государства, которого не было никогда.

Тема, выбранная автором, является достаточно актуальной. Целью написания статьи является попытка доказательства фальсификации исторических фактов армянами.

Методологической и теоретической основой, данной статьи стали архивные материалы, которые

сохранились в архивах страны (в данном случае автор использовал материалы из Архива общественно-политических документов Управления делами Президента Азербайджанской Республики), что и позволило, комплексно подойти к поставленному вопросу.

Основная часть статьи

Во все периоды существования системы международных отношений Азербайджан занимал важное место в евразийской политике России. Ещё во времена царской России выход к Каспийскому морю, захват Северного Азербайджана и использование этой территории для вторжения и влияния на Иран, Турцию и другие восточные государства занимали особое место в деятельности российских императоров. Вопрос Азербайджана постоянно находился в центре внимания в ходе русско-иранских, русско-турецких войн, завоевания Кавказа и других событий. Империя даровала армянам земли в Закавказье, затем способствовала переселению туда армян из Турции, Ирана, арабских стран, одновременно вытесняя оттуда турок (азербайджанцев - авт.), выселяя их за пределы Армении. Этот процесс начался и в советский период. В годы советской власти Азербайджан также использовался в качестве форпоста для влияния на Восток, играл роль «выхода» к Востоку [6, с.165].

Однако факты остаются фактами. Ещё в X веке известный арабский географ и путешественник ибн Хаукаль (Абуль-Касим Мухаммад ибн Хаукаль ан-Нисибин) в своём труде «Книга путей и стран» («Китаб ал-масалик ва-л-мамалик») изложил ценные сведения о территории Аббасидского халифата, а также об окрестных странах. В работе имеется обширная и очень ценная информация об Азербайджане. Арабский географ ибн Хаукаль, описал в своём труде и Армению, при этом имея в виду не государство (как хотелось бы армянским лжеучёным), а географическую или административную область «Арминия» в Малой Азии и приграничье Южного Кавказа, которую не обязательно связывает с армянами, как пытаются сейчас это сделать армянские псевдоучёные.

Историк Ризван Гусейнов в своей статье «Большой Азербайджан в российских, европейских и иных источниках – Часть V» ещё раз указывает на важность произведения ибн Хаукаля и пишет, о том как арабский автор в своём труде отмечает, что «Горы его (аз-Завазан – Р.Г.) тянутся от Хариса и Хувайриса (Харис - большой Арарат и Хувайрис - малый Арарат – Р.Г.) до цепей Агара и Варзакана (гора Савалан в Южном Азербайджане – Р.Г.) затем тянутся на север к Тифлису, где с ними соединяется хребет Кабк (Кавказский хребет). Хребет этот огромный; говорят, что на нем 360 языков; я раньше отрицал это, пока не увидел сам много городов, и в каждом городе есть свой язык помимо азербейджанского и персидского»[7].

Уже в начале статьи можно с уверенностью отметить, что как бы не пытались армянские фальсификаторы изменить исторические факты в свою пользу у них это, никак не получается, так как научные исторические сведения гласят совершенно об

ином. Мы в отличие от армян проживаем на своей исторической территории, в целом, даже, сегодняшние армяне должны быть благодарны нам за существование своего государства с 1918 года.

Г. Орджоникидзе (курировал внутренней и внешней политикой Азербайджанской ССР) в середине 1920 года Сталину и Чичерину, предлагал выделить Нагорный Карабах в автономную область в составе Азербайджанской ССР [10].

В конце июня 1920 года, после обсуждений с ново назначенным полномочным представителем Советской России в Армении Б.Леграном и А.Габриеляном, Г. Орджоникидзе по прямому проводу сообщил в Москву следующее: «Азербайджан настаивает на немедленном и безоговорочном присоединении Карабаха и Зангезура... Я заставлю Азербайджан объявить автономию этих областей, но это должно исходить от Азербайджана, но ни в коем случае не должно быть упомянуто в договоре» [5, с.125]. Уже 7 июля 1923 г. ЦИК Азербайджанской ССР издал декрет «Об образовании Автономной Области Нагорного Карабаха» (АОНК).

АзЦИК постановил:

1) Образовать из армянской части Нагорного Карабаха автономную область, как составную часть АССР, с центром в местечке Ханкенди;

2) Органами управления автономной области являются: областной исполнительный и местные Советы;

3) До образования Областного Исполнительного Комитета создать Временный революционный комитет, коему вменить в обязанность не позже 2-х месяцев созвать съезд Советов для избрания постоянного исполнительного органа. Для выработки положения области и фактической передачи административных единиц в автономную область Карабаха, а также определения границ автономной области создать смешанную комиссию из представителей Нагорного Карабаха, Низменного Карабаха, Курдистана и центральной власти АССР [12].

Как уже было указано выше, исторические территории Азербайджана были переданы армянам в ходе кабинетных игр советской власти, что и в последующем стало предпосылкой для начала конфликта вокруг Нагорного Карабаха.

В 1977 году на заседании комиссии по разработке нового закона страны, было объявлено о том, что из НКАО и Армянской ССР поступили обращения граждан с просьбой рассмотреть вопрос о передаче НКАО из состава Азербайджанской ССР в состав Армянской ССР, которые будут рассматриваться на следующем заседании. Только после объяснений Гейдара Алиева о всех последствиях Брежнев дал указ снять этот вопрос с обсуждения [13, с.97].

До этого в годы СССР вопрос о судьбе Нагорного Карабаха не раз обсуждался в высших эшелонах страны. Например, специальной комиссией данный вопрос обсуждался на конференции в Тифлисе из представителей трех республик (Азербайджан, Грузия, Армения –авт.), совместно со Сталиным. Однако, вопрос остался открытым, так как,

Нариманов настаивал на неприсоединении Нагорного Карабаха Армении [17].

Ещё один важный момент давления на азербайджанский народ - система образования, благодаря которой, ещё царская Россия пыталась успешно внедрить свои амбиции на наших исторических территориях, тем самым, создавая себе оплот в лице армян на Кавказе.

Например, царское правительство проводя великодержавную политику, стремилось держать азербайджанский народ в невежестве, мешало развитию национальной культуры. Царизм намеренно культивировал патриархально-феодалный уклад жизни, стеснял, а иногда просто упразднял местную школу и просветительные учреждения.

Со времени открытия первой школы в 1830 году и до 1855 года в Азербайджане было открыто всего 8 начальных школ. В них учились дети русских чиновников, а также местных ханов и беков.

Политика царского самодержавия в области школьного строительства в национальных окраинах нашла своё яркое отражение на VII Всероссийском дворянском съезде в 1911 году. «Школа государственная, - объявлялась на съезде, - должна быть русской, национально-патриотической, правительственная школа не может иметь инороднического характера, в ней должен без каких-либо уступок господствовать государственный язык, обучение должно вестись на русском языке...»

Политику насильственной русификации можно определить, также из того, что удельный вес школ, в которых обучение коренного населения велось на родном языке, неизменно уменьшался с 17,9% в 1870 году до 0,6% в 1888 году. Число школ с обучением исключительно на русском языке увеличилось с 49,8% в 1879 году до 88,2% в 1901 году. Русификаторская политика царского правительства отражалась и в учебных планах. В это время основная масса азербайджанцев обучалась в мектебах и в медресе и получала главным образом религиозное образование.

Говорить о высшем образовании не приходилось. Причём не только в Азербайджане, но и во всём Закавказье¹ высшие учебные заведения, за исключением женских курсов в Тбилиси, отсутствовали [4, с.9-15].

Интеллигентов, вышедших из народа, среды рабочих и крестьян (учителей, врачей, инженеров, агрономов и прочих) можно было перечислить по пальцам. Накануне социалистической революции среди азербайджанцев было лишь около 100 учителей, 45 врачей, 12 инженеров, 2 агронома и 2 землемера. Особенно плохо было организовано медицинское обслуживание населения. На каждые 50 тысяч жителей приходился один врач, на каждую больницу койку – 7348 человек [3, с.10,11].

За годы же существования СССР для усиления

позиции властей использовалась система отрицания любой монотеистической религии, усиленно велась пропаганда научного атеизма, наряду с этим, также знание русского языка стало важным показателем грамотности по всему СССР.

В *Архиве общественно-политических документов Управления делами Президента Азербайджанской Республики* сохранился интересный материал об указе советской власти открыть книжные киоски в Нагорной части Гянджинского уезда, чтобы все армянские школы были обеспечены учебниками на армянском языке [18]. Также предлагалось НКПросу (Народный Комиссариат Просвещения –авт.) открыть армянское отделение при сельскохозяйственном техникуме в Гяндже [19].

Итак, советская власть делала все возможное чтобы превратить территории Азербайджана в зону комфорта для армян.

Немаловажным является и тот факт, что в советские годы в реставрационные работы памятников истории и культуры в НКАО, привлекались армянские мастера [20].

«Армянские специалисты» всячески пытались арменизировать все исторические памятники Нагорного Карабаха, создавая почву для своих потомков, которые до сих пор твердят миру о том, что являются аборигенами на этих территориях. При этом, забывая, что ценные исторические материалы о принадлежности Нагорного Карабаха Азербайджану, сохранились материалы не только в наших архивах, но и во многих архивах зарубежных стран.

В советские годы к агитационной работе властей подключились и газеты страны. Например, газета «Коммунист», «Советакан Аяастан» [21].

Продолжением советской политики по установлению плацдарма на азербайджанских территориях стал и факт создания Курдистанского уезда² в составе Азербайджанской ССР (1923-1929 гг.). Сохранились также документы о том, что в ходе беспорядков в Курдистане (Курдистанский уезд – авт.), так как крестьяне этих территорий были «раздеты, разуты и голодны» [23], армяне, воспользовавшись моментом стали распускать «слухи о переходе Курдистана в состав Советской Армении» [22].

Одной из самых актуальных проблем последних лет считается терроризм. Этот процесс влечёт за собой разрушения и человеческие жертвы. Но из истории мы знаем, что армяне прибегали к актам террора ещё в 80-90-ые гг. XIX века на территории Османской империи [1, с.81].

В книге Эриха Файгла «Правда о терроре. Армянский терроризм - истоки и причины» автор рассматривает события 1915 года, где объективно пишет об армянской политике, об их зверствах. «События 1915 года в Османской империи нельзя называть «геноцидом». Война с Турцией – священная война для армян в своём роде крестовый поход.

¹Закавказье – южный Кавказ

² Административный центр уезда — город Лачин (до 1923 года имел статус посёлка, до 1926 года назывался

Абдаляр). Делился на 6 дайр (волостей): Каракишлагскую, Кельбаджарскую, Кубатлинскую, Котурлинскую, Кюрд-Гаджинскую и Мурадханлинскую. *Курдистанский уезд просуществовал в 1923 1929 гг.*

Энтузиазм среди армян таков, что не проходит и дня, чтобы на улицах Карса, Александрополя и Эривани не проходило манифестаций с речами многовекового врага и угнетателя христиан» [15, с.48].

О зверствах и шовинизме армян сохранился ещё один документ, в котором излагаются итоги политики дашнаков на границе между Шушинским уездом и Зангезуром. В документе отмечается: «у одного были пробуравлены глаза, кожа с лица скальпирована, мясо на теле местами вырезано, руки и ноги отпилены. В общем, трупы на стелке изуродованы, что не поддаются описанию» [24].

Польский историк Тадеуш Свентоховский в своей статье «Русское правление, модернизаторские элиты и становление национальной идентичности в Азербайджане» писал: «Вряд ли можно сомневаться, что царское правительство использовало антагонизм для укрепления своего режима, но нет убедительных доказательств, что массовое насилие сознательно провоцировалось властями; враждебность достигла такой степени, когда для возникновения взрыва не нужно было никакого подстрекательства извне. Понятие «татаро-армянская резня» достаточно точно передаёт природу межобщинного насилия, начавшегося в феврале 1905-го и продолжавшегося в течение следующего года» [14].

За годы советской власти делалось все возможное и даже невозможное, чтобы искусственным образом увеличить численность армян на исторических территориях Азербайджана, что стало частью политики СССР на пути превращения азербайджанских территорий в плацдарм на Южном Кавказе, также в зону комфорта для армян, а это всё, в свою очередь, в последующем послужило трамплином для создания армянской государственности на наших территориях. Одновременно за годы советской власти в Армении соотношение численности армян и азербайджанцев менялось с каждым годом не в пользу последних. К сожалению, в этот период в политических заявлениях и подходах лидеров Азербайджанской ССР были обойдены молчанием проблемы азербайджанского населения в Армянской ССР [11, с.257].

Этапы борьбы за Нагорный Карабах

Полагаю, можно было бы выделить несколько этапов борьбы за территорию Карабаха армянами.

1. (1747-1827 гг.) – борьба между Российской, Османской и Иранской империями;
2. (1828-1918 гг.) – период торжества шовинистический, агрессорской политики царской России, для превращения территории Кавказа в плацдарм. Начало процесса сукцессии, т.е. как и было указано выше, насильственные изменения этнического состава территории Нагорного Карабаха;
3. (1920-1990 гг.) – 70 лет советской этногеополитики в районе Нагорного Карабаха и автономизация этой территории, который и заложил основу распада СССР и начала конфликта вокруг Нагорного Карабаха [2, с.84].

В целом, «Армяне, неоднократно расширявшие за годы Советской власти свою территорию за счет Азербайджана, осуществляли в то же время, при поддержке Москвы, и депортацию азербайджанцев с их родных земель в Северо-Западном Азербайджане (ныне территории Республики Армения). Эта политика проводилась последовательно и целенаправленно. Азербайджанцы были лишены права получать образование на родном языке. Тысячи азербайджанских топонимов были изменены на армянские названия в соответствии с принятыми на государственном уровне решениями. Были ликвидированы традиционные для азербайджанцев отрасли хозяйства. Тысячелетние азербайджанские кладбища были превращены в посевные площади. Сотни караван-сараяв, мечетей, медресе, минаретов, бань и других историко-архитектурных памятников Азербайджана были стерты с лица земли» [9, с.8].

О том, что армяне всегда претендовали на наши территории, причем все не только на Нагорный Карабах, свидетельствует книга известного историка Филиппа Экозьянца «Израил Ори. Ларец Пандоры». Автор в данной книге излагает переписку армян, их планы о завоевании наших городов. Например, историк раскрывает письмо, в котором армяне пишут: «... чтобы к рассвету прибыть в Шемаху, которая огромна, как Кёльн, неукрепленная, где есть один управляющий из персов...» [16, с.151]. Или же «Шемаха – город очень богатый и торговый, без каких-либо войск внутри...» [16, с.151]. «Есть город Ордубад, он полностью турецкий...» [16, с.152]. Итак, автор раскрывает все тайные переписки меликов, их коварные планы по захвату территорий Азербайджана и Османской Турции.

Интересно, но объективно настроенные люди находятся и среди европейских авторов. Например, слова француза Ж.Малевиля об армянской агитации стали пророческими: «Для того, чтобы остановить этот произвол армянской пропаганды, рискующий иметь для будущего Европы весьма тяжкие последствия, необходима реакция всех здравомыслящих людей» [8, с.115].

Заключение

Исходя из всего вышесказанного, мы ещё раз убеждаемся в том, что армянские шовинистические силы, во все периоды истории, шли на все крайности, чтобы достичь своей заветной цели – создания «Великой Армении», государства, которого не было, нет и не может быть на политической карте мира. Таким образом, бредовая идея для создания «Великой Армении» от моря до моря на чужой территории является главной линией во внешней политике агрессорской Армении. Во времена царской России и за годы существования СССР советская Россия также продолжала по отношению к Азербайджану агрессорскую политику, с целью имплементации своих планов на Южном Кавказе, чтобы создать себе плацдарм на этих территориях, при этом пользуясь обширной поддержкой также иранских властей.

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THE CONCEPT AND THEORETICAL APPROACHES IN THE STUDY OF MIGRATION**Kenbaeva A.B.,***Master's student,**Zhetisu university after named is I.Zhansugurov,**Takdykorgan (Kazakhstan)***Baigabatova N.K.***Candidate of Historical Sciences,**Zhetisu university after named is I.Zhansugurov,**Takdykorgan (Kazakhstan)*[DOI: 10.5281/zenodo.7747173](https://doi.org/10.5281/zenodo.7747173)**ПОНЯТИЕ И ТЕОРЕТИЧЕСКИЕ ПОДХОДЫ В ИЗУЧЕНИИ МИГРАЦИИ****Кенбаева А.Б.***Магистрант,**Жетысуский университет им. И.Жансугурова,**Талдыкорган (Казakhstan)***Байгабатова Н.К.***Кандидат исторических наук,**Жетысуский университет им. И.Жансугурова,**Талдыкорган (Казakhstan)***Abstract**

This article is devoted to the review of theoretical approaches to the study of migration processes. The paper considers historical, economic, political, geographical, demographic, sociological, and legal approaches. The issues of defining migration in the interpretation of the above-mentioned scientific approaches become central in the studied problem. Of particular scientific and theoretical importance are the essential characteristics of migration, each of which complement each other. The purpose of our work is to analyze current theoretical trends in the consideration of international migrations.

Аннотация

Данная статья посвящена обзору теоретических подходов к изучению миграционных процессов. В работе рассматриваются исторический, экономический, политический, географический, демографический, социологический, юридический подходы. В исследуемой проблематике центральными становятся вопросы касающиеся определения миграции в интерпретации вышеуказанных научных подходов. Особое научно-теоретическое значение имеют сущностные характеристики миграции, каждое из которых дополняют друг-друга. Целью нашей работы является анализ современных теоретических тенденций в рассмотрении международных миграций.

Keywords: migration, migration process, historical approach, sociological approach, legal approach, geographical approach, economic approach, political approach.

Ключевые слова: миграция, миграционный процесс, исторический подход, социологический подход, юридический подход, географический подход, экономический подход, политический подход.

Миграция в современном мире приобретает глобальный характер. Понятие миграция как термин появилось и закрепилось в законодательных актах государств совершенно недавно. Однако сам миграционный процесс берет свое начало с возникновением человека. Стоит отметить, миграция происходила из-за исторических, экономических, политических, социальных факторов или событий. В истории очень много пространственных перемещений, связанных с теми или иными событиями. Так например, Великое переселение народов, период после Второй мировой войны, война во Вьетнаме, репрессии в годы Советского союза и так далее. В результате исследования мы раскрыли сущность понятия миграция.

Миграция охватывает все страны, приводя к изменению общества или региона. В особенности

миграция получила широкий размах в XXI веке, когда началось развитие промышленности, технологии и инновации. По социологической оценке, Отдела народонаселения Департамента по экономическим и социальным вопросам Организации Объединенных Наций, сегодня в мире с населением 7 млрд человек по крайней мере 214 млн проживают за пределами стран, где они родились [1, с.52-53]. Вышеизложенное показывает, что миграционный процесс занимает огромную роль в жизни общества.

Первостепенное значение для решения поставленных нами задач, имеют исследования, непосредственно направленные на изучение феномена миграции. Привлекают внимание в аспекте нашего исследования работы крупных ученых. Впервые систематическое исследование проблемы было начато Е. Равенштейном в 1885-1889 гг. Важным

для нашего исследования является определение «миграция», предложенное ученым: «Это – постоянное или временное изменение местожительства человека, как непрерывный процесс» [2, с.167-168]. Заслуживает быть отмеченным что автор своим трудом обозначил 11 законов миграции.

Существует ряд работ, посвященных определению понятия миграции. Выявление специфических особенностей феномена «миграция» является тем основанием, на котором строятся все остальные аспекты исследования. Еще в 1978 г. Л.Л. Рыбаковский в своем труде «*Миграция населения: прогнозы, факторы, политика*» отмечал, что «в демографической науке, как, впрочем, и в других науках, изучающих миграцию, ни одно понятие не имеет столько различных трактовок как миграция» [3, с.70]. Необходимо отметить, что с каждым годом число трактовок растет. Вследствие этого в научной среде встречается множество прилагательных, которые в свою очередь конкретизируют термин «миграция». Например: сезонная, временная, трудовая, сельская, образовательная и т.д.

По Л.Л. Рыбаковскому, который предложил формулировку понятия миграция в 1987 году: «...любое территориальное перемещение, совершающееся между различными населенными пунктами одной или нескольких административно-территориальных единиц, независимо от продолжительности, регулярности и целевой направленности представляет собой миграцию в широком значении этого слова» [3, с.26]. Исходя из его определения, мы видим, что, миграция населения – это многомерное явление, причины и последствия которого должны рассматриваться на всех уровнях таких как макро и микро. Автор выделяет три подхода. Первый подход включает в себя все многообразие пространственного движения населения. Второй подход – перемещение между населенными пунктами, представляет собой двустороннее движение между местом жительства и сферой труда, учебы. Данная миграция может привести к постоянной или временной смене места жительства. Третий подход – это процесс пространственного движения населения, который приведет к территориальному перераспределению [3, с.21-22].

В общепринятой науке «миграция» в переводе с латинского (*migratio*) означает переселение, перемещение [4, с.160], но стоит отметить, что они не идентичны. Сфера таких исследований весьма разнообразна и получила освещение в ряде научных трудов. Приведем все трактовки данного феномена. Интересный факт, в своем труде профессор МГУ В.А. Ионцев «Международная миграция населения: теория и история изучения» отметил, что в отечественной литературе насчитывается 36, а в зарубежной 27 определений термина «миграция» [5, с.19]. Миграция – одна из форм движения населения, при которой перемена места жительства на более или менее значительное расстояние и время сопровождается общественно значимыми экономическими, социальными, демографическими и другими последствиями (позитивными и негативными,

явными и скрытыми, текущими и долгосрочными и т.д.) [6, с.24].

Необходимо подчеркнуть, что вопросы миграции исследовали ряд ученых таких как, А.У. Хомра, Б.С. Хорев, М.В. Курман, М.Б. Денисенко, В.И. Переведенцев и многие другие. По предложению кандидата философских наук Е.Ю. Садовской «миграция – это передвижение населения через государственные границы, связанное с переменной местожительства и требующее внутригосударственного и межгосударственного регулирования [7, с.20]. По нашему мнению, данная формулировка, узконаправленная так как не повествуются мотив и сроки миграции.

А.У. Хомра объединил определения термина «миграция» на три группы: первая группа – подразумевает собой распределение по территориальной, отраслевой, профессиональной и социальной основе; вторая группа – представляет собой совокупность механических, профессиональных, отраслевых перемещений; третья группа – охватывает любое перемещение в пространстве [8, с.5 – 6]. В Законе о миграции Республики Казахстан дается характеристика и определение понятию: «миграция – это безвозвратное, временное, а также сезонное перемещение физических лиц из Республики Казахстан, а также переселение физических лиц внутри Республики Казахстан, связанное со сменой места жительства и работы» [9, с.275].

Л.Л. Рыбаковский в своем труде систематизировал все определения миграции в четыре группы, по сущностному подходу. Рассмотрим четыре группы детально: первая группа включает в себя такие понятия как миграционный процесс и результат. Представители первой группы: В.А. Суков, Н.Н. Филиппов. Они характеризуют миграцию как перемещение внутри страны по разным причинам (отраслевые, территориальные, профессиональные, социальные). Вторая группа включает в себя понятия «мобильность», «перемещение». Однако Л.Л. Рыбаковский отмечает в труде, что следует отличать мобильность от перемещения. Мобильность – это способность к миграции. Третья группа рассматривает миграцию как смесь всех видов движения, в особенности социального и миграционного. Представителем данной группы был М.В. Курман, в своих трудах он дал описание образовательной, профессиональной и производственной миграции. Пришел к выводу объединив все определения в одну и дал понятие «социальная миграция». Обратим внимание на четвертую группу, которую признали большинство ученых. Данная группа характеризует миграцию как территориальные перемещения. Сюда относят внутри- поселенные и межпоселенные перемещения [10, с.224]. Следует обратить внимание в научной области встречаются много прилагательных, которые конкретизируют само понятие. Например: вынужденная, добровольная, постоянная, временная, маятниковая, сезонная, челночная, экономическая, трудовая, сельская, городская, международная и так далее.

Глубокое и всестороннее рассмотрение различных аспектов теории миграции содержится в

трудах зарубежных исследователей, где дается научное обоснование. А. Золберг в ходе своего исследования, анализируя труд Е. Равенштейна отметил, что автор в своем труде допустил упущение: «международная миграция развивается по тем же законам, что и внутренняя миграция». «Результатом этого – отмечает А. Золберг – явилось появление теоретической парадигмы, лишь отдаленно связанной с реальностью» [11, с.270].

В этом контексте представляется весьма актуальным определение, данное в работе Д. Массея: «Специалисты по общественным наукам подходят к изучению миграции не с позиций общей парадигмы, а с позиций разных и конкурирующих друг с другом теоретических воззрений, раздробленных между дисциплинами, регионами и идеологиями» [12, с.700]. Важный факт в работе Д. Массея заключается в определении сущности международной миграции. Особое значение в свете новых задач приобретает разработка Дугласом Массеем в 1990 году в соавторстве с исследователями, международной теории миграции. Данная теория раскрывает понятие миграции как связь экономической, политической и общественной жизни. Международная миграция возникает из-за недоразвитости государства [13, с.150].

Принципиально новые решения в исследовании миграции предлагает экономическая наука во второй половине XX века. Основывается на притягивающих и выталкивающих факторах, берущих свое начало с гипотез немецкого исследователя Эрнст Георг Равенштайна. В экономическом подходе зародилась новая теория так называемая неоклассическая, согласно которому человек должен мигрировать с большой выгодой и наименьшими затратами [14, с.25]. В исследуемой проблематике центральными становятся вопросы регулирования спроса и предложения на рынке рабочей силы. Важным для исследования является положение о том, что согласно неоклассической теории миграции, в богатые страны должны мигрировать в основном беднейшие люди. Однако стоит отметить, что в априори мигрируют в большинстве представители среднего класса из развитых стран.

Миграция является историческим процессом, который повлиял на жизнь многих наций. Как мы отметили выше в науке множество подходов в изучении миграции как феномена. Вследствие это ведет к комплексному изучению всех подходов, в рассмотрении наиболее значимых. Подходы, которые смогут отвечать требованиям современности для решения тех или иных задач. В науке выделяют 17 основных подходов в изучении миграции. Данные подходы подразделяются на 45 научных направлений, 15 направлений составляя экономический подход, 5 на социологический, 4 миграционный, 3 на демографический, 2 на типологический, исторический, политический. Рассмотрим каждый подход.

Политический подход изучает политические стороны миграции. Политический подход состоит из политологического направления и теории институционализма. Политическая миграция регулируется

государством. Представителями политологического направления принято считать: А. Золберг в 1981-1989 гг. занимался исследованиями в данной области, А. Доути (1987 г.), М. Вейнер (1990 г.). Первостепенное значение для анализа политологического направления, имеют исследования, непосредственно направленные на изучение миграции по типу международной. Данное направление подразумевает собой как взаимодействие между государствами, в ходе которого происходит юрисдикция. Теория институционализма в качестве изначального пункта видит усиление миграции через развитие разных организаций, оказывающих помощь мигрантам. Яркими представителями данной теории принято называть: Ж. Тапинос, Дж. Холлифилд, А. Золберг.

Привлекает внимание работа Ю.Г. Ефимова «Политическая миграциология: миграционные процессы в контексте политических проблем» и А.В. Топилина «Миграция населения и формирование трудовых ресурсов в СССР и на постсоветском пространстве: тенденции и регулирование». В труде А.В. Топилина рассматриваются проблемы миграции населения и трудовых ресурсов за 1973-2019 гг. Отражены влияние миграции на трансформацию этнодемографических структур, на занятость населения. На основе результатов автор разрабатывает плановый механизм регулирования населения [15]. Следует отметить, что в рамках подхода проводятся исследования миграционных процессов в сфере государственных структур, которые оказывают помощь мигрантам.

Демографический подход в свою очередь представляет исследования касающихся человеческих ресурсов, численности, национального состава. Демографический подход состоит из общей теории народонаселения, демографический переход, нулевое сальдо международной миграции и замещающая миграция. По теории общего народонаселения существует несколько точек зрения, которые можно свести к двум основным. Первая точка зрения, миграция как демографический процесс, прямо воздействующий на воспроизводство населения, возрастную, половую структуру. Вторая точка зрения, миграция – многогранное явление, включающий политический, экономический, географический аспекты, оказывающие влияние на демографию в обществе. Представителями данной теории являются А. Сови, Дм. Валентей, А. Кваш, Н. Зверев.

В результате изучения демографического перехода, был получен материал, анализ которого позволил заключить что данная теория последовательно изменяется при переходе от доиндустриальной к постиндустриальной экономике. Рассматривая эволюцию демографического развития во времени и пространстве. Большой вклад внесли в эту теорию К. Дэвис, Д.Боуг, У. Петересон, В. Зелинский, В. Ионцев, Л. Рыбаковский. Важным для исследования является замещающая миграция сущность которого заключается в следующем: как остановить депопуляцию населения в развитых странах; как быстро решить проблемы стареющего

населения; можно ли заместить молодыми мигрантами коренное пожилое население на рынках труда.

В рамках демографии решаются проблемы и задачи в области национальной безопасности страны. Наиболее интересные труды о демографическом подходе оставили после себя исследователи Б.С. Хорев, Л.Л. Рыбаковский. Книга Л.Л. Рыбаковского «*Миграция населения: прогнозы, факторы, политика*» состоит из трех монографий. В каждом томе рассматриваются разные аспекты миграции. В первой монографии повествуется исторические переселения населения по всему миру. Во второй монографии дается анализ и авторская трактовка системы дефиниций применяемых для исследования миграционных процессов. В третьей монографии рассматривается теоретическое описание трех стадий миграционных процессов.

Следующий наиболее значимый подход: исторический. Особое научно-теоретическое значение для исторического подхода имеют историческое направление, историко-демографическое, теория исторического структурализма. Весьма полезными для обширного круга исследователей оказались результаты исторического направления, которое рассматривает историю миграционного движения, собственно объясняющее роль и значение миграции для отдельных государств. Здесь уместно обратить внимание что исторический подход и его методы применяются при исследовании миграции. Яркими представителями данного направления считают Л. Мох, Х. Динер, А. Тойнби, Ф. Бродель, А. Шлепаков, Ю. Квашин.

Направление, рассматривающее миграцию в контексте с исторической эволюции демографических процессов, получило наименование историко-демографическое. Ученые, исследовавшие данное направление: Е. Кулишер, В. Кабузан, Н. Горская, А. Кауфман. Сюда можно отнести труды, в которых описывается историография в области данной сферы. Самые интересные и информативные труды: В.М. Кабузан «Эмиграция и реэмиграция в России в XVIII – начале XX века», А.А. Кауфман «К вопросу о причинах и вероятной будущности русских переселений». Труд В.М. Кабузана «Эмиграция и реэмиграция в России в XVIII – начале XX века» одно из наукоемких книг, в ней исследуются внутренние миграционные процессы в России, эмиграция населения за рубеж, динамика их численности, расселения, иммиграция в Россию [16]. Автор на основе архивных материалов таких как РГАДА, РГИА, РГВИА попытался раскрыть феномен эмиграция и реэмиграция.

Особый интерес представляет социологический подход, представляющий собой анализ мигрантов, то есть их связи и адаптация в новых условиях. Учитываются факторы внутренние и внешние. Направления составляющие данный подход: притяжение – выталкивание (pull/push), миграционная система связей (сетей) или теория «миграционной цепи», культурологическое, ассимиляционная теория, этносоциологическое. Впервые систематическое специальное исследование берет свое начало с направления притяжение – выталкивание.

Миграция рассматривается как функция относительной привлекательности стран въезда и выезда, то есть играет фактор притяжения. Наличие препятствий в странах ведет к выталкивающим факторам, то есть интерес мигрантов в переезде уменьшается. Представителем данного направления принято называть Е. Ли.

Принципиально новые решения проблемы дает направление миграционная система связей (сетей) или теория «миграционной цепи». В основе которой лежит феномен «сообщество мигрантов». Что же представляет собой данное понятие? Это понятие включает в себя межличностные отношения, связывающее мигрантов. Глубокое и всестороннее рассмотрение различных аспектов данной теории содержится в трудах крупных ученых Д. Гуррак, Ф. Кейсес, Д. Массей, А. Симмонс. Анализ социологического подхода позволяет выделить одно из важных направлений так называемое культурологическое. Суть данного направления состоит в том, что миграция происходит во взаимодействии между мигрантами двух разных стран и в рамках определенной территории, объединяющих обе стороны. Данное направление изучалось на международном уровне, представителями Х. Эссе, Дж. Рекс, Дж. Бастамант в разные годы.

Весьма полезным для нас в этом направлении оказались труды таких социологов как Т.Н. Юдина «Миграционные процессы: теория, методология и практика социологического исследования» и Ю.В. Арутюнян «О потенциале межэтнической интеграции в московском мегаполисе». Наибольший интерес представляет труд Т.Н. Юдина «Миграционные процессы: теория, методология и практика социологического исследования» отражено авторская типологизация моделей исторических трансформаций миграционных процессов, исследуется значимость миграции. Проведена систематизация зарубежных концепций, на основе критического анализа теорий интеграции дается ответ на ряд вопросов в области миграции [17]. Автор в своем труде провел социологические исследования и вследствие результатов конкретизировал направления, тенденции миграционных процессов, предложил ряд решений по урегулированию социальных отношений между мигрантами и местным населением.

Рассмотрим следующий подход юридический, которого определяют нормативно-правовые акты, для урегулирования социальных отношений в данной сфере. Юридический подход состоит из правоведческого направления. Правоведческое направление может быть законодательно-обязательным или рекомендательным. Свои исследования в этой области оставил С. Филиппов в 1973 году, А. Анисимов в 1990 году, А. Овсюк в 1980 году и последний среди исследователей М. Тюркин в 2005 году. Данные ученые изучали миграцию на международном уровне. Здесь уместно обратить внимание на труды: В.И. Мукомеля «Адаптация и интеграция мигрантов в России: вызовы, реалии, индикаторы» и М.Р. Вокуева «Миграционное право современной

России: теоретико-правовой анализ» [18]. В монографии В.И. Мукомеля отражены результаты взаимоотношения местного населения (одной территории) и мигрантов. Центральное внимание уделяется к доступу образования, гражданства, здравоохранения.

Принципиально новые ответы на вопросы в области изучения миграции дает географический и экономический подходы. Они играют большую роль в сфере миграции. Экономический подход рассматривает миграцию в области перераспределения трудовых ресурсов, подсчет численности трудоспособного населения. Данный подход включает в себя такие направления как: меркантилизм, классическая, мальтузианство, марксизм, неоклассическая, теория «человеческого капитала», кейнсианство, мировой рынок труда, новая экономическая теория миграции и так далее. Глубокое и всестороннее рассмотрение различных аспектов миграции в экономическом плане содержится в трудах известных исследователей: Т. Ман, А. Смит, А. Маршалл, Т. Мальтус, Д. Массей, К. Маркс, Ф. Энгельс и многие другие. Научные работы, касающиеся экономической миграции: «Методологические проблемы разработки и реализации государственной миграционной политики» О.Д. Воробьева [19, с.90-100]. В статье О.Д. Воробьевой анализируются миграционные процессы в современной Российской Федерации. Автор дает оценку реализации миграционной политики России в конце XX в., формулирует методологические основы разработки и реализации данного процесса.

Особое научно-теоретическое значение в исследовании феномена миграции имеет следующий подход: географический. Географический подход состоит из двух направлений: географического и урбанистического. Исследуя географическое направление, мы исходим из основных концептуальных положений, что это одно из первых значительных подходов, внесших вклад в изучении миграции. Имеется ряд работ в географических журналах, касающихся географических факторов миграции. Здесь уместно назвать имена великих ученых таких как Е. Равенштейн и В. Зелинский. В рамках данного направления получает развитие так называемые картографические и графические методы. В дальнейшем изучении миграции получает развитие в работах Х. Джонса, А. Ягельского, В.В. Покшишевского, А. Алексеева и многих других. Так, например в труде В.В. Покшишевского «Население и география: Теоретические очерки» автор рассматривает теоретические проблемы населения, закономерности, демографические тенденции, урбанизацию, миграционные процессы, междисциплинарную связь. Принципиально новые решения проблемы в области миграции дает урбанистическое направление. В этом плане миграция рассматривается как фактор развития городов и роста численности городского населения. Освещение теоретического аспекта нашло отражение в монографиях, в ряде статей, диссертаций таких крупных ученых К. Девис, А. Кэмпбелл, Д. Пумэн, М. Брокерхоф и другие.

Теоретический анализ литературы позволяет нам выделить еще одно направление в изучении миграционной теории. Это – гендерный аспект, который подразумевает собой миграцию женщин. Выявление специфических особенностей гендерной миграции связано с активизацией феминистического движения охватившее многие страны зарубежья в 1960-1970 гг. Исследованием гендерного подхода занимались ученые Х. Злотник, М. Мороквасиц, Н. Ойши и другие. Весьма полезными для нас оказались результаты исследований социологической доли женщин в структуре миграции, в котором доля женщин колеблется в районе 50 % [20, с.1-2]. Особое значение в гендерном подходе приобретает рассмотрение широкого круга вопросов таких как переселенческое поведение, обеспеченность работой женщин-мигрантов, социальный статус женщин, адаптация в новых условиях и так далее.

Важным для исследования является описание феномена миграция немецким исследователем Т. Шварц. В своем труде он отмечает, что миграционные режимы входят в состав систем. Кроме того, он предложил свою теорию, вместо термина миграционные системы он использовал понятие миграционная конфигурация [21, с.14]. В его труде прослеживается интересная точка зрения: миграция на постсоветском пространстве стала составной частью мирового миграционного движения, вследствие оно влияет на мировой поток миграций. Из сказанного становится очевидным то, что с каждым годом увеличивается объем миграции, что создает предпосылки для их изучения и возникновения новых миграционных теорий.

В результате изучения был получен материал, анализ которого позволил заключить, что миграция – это сложный многогранный и социальный процесс. Перечисленные исследования внесли огромный вклад в науку. Однако стоит отметить, что в цитированных выше работах есть определенная преемственность – большинство ученых в ходе своих исследований опирались на опыт предыдущих исследователей. Таким образом, анализ исследований, посвященных разработке проблемы изучения миграции, позволяет сделать следующий вывод: «Миграция населения – территориальное перемещение населения, связанное с пересечением как внутренних, так и внешних границ независимо от целей мигрантов». Теоретический анализ литературы позволило рассмотреть подходы миграционных процессов. Данные подходы составляют целостную картину закономерностей мобильности населения в глобальном масштабе.

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JURISPRUDENCE

EVOLUTION OF NORMATIVE REGULATIONS REGARDING ENVIRONMENT PROTECTION

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EVOLUȚIA REGLEMENTĂRIILOR NORMATIVE PRIVIND PROTECȚIA MEDIULUI ÎNCONJURĂTOR

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Abstract

Subjective rights cannot be exercised without being correlated with legal obligations, because these two components make up the content of any legal relationship. Man, respectively human society, enters into more or less intense and complex relationships with the environment. The first regulatory elements of the environment protected human health by combating the pollution of essential local resources, such as drinking water, air, fauna and flora. The concern for the state of the environment and its components is increasing due to the immense dangers that threaten the living conditions on the planet and the very future of the human species.

Rezumat

Drepturile subiective nu pot fi exercitate fără a fi corelate cu obligațiile juridice, deoarece aceste două componente alcătuiesc conținutul oricărui raport juridic. Omul, respectiv societatea umană, intră în relații mai mult sau mai puțin intense și complexe cu mediul. Primele elemente de reglementare ale mediului ocroteau sănătatea omului prin combaterea poluării resurselor locale esențiale, precum apa potabilă, aerul, fauna și flora. Îngrijorarea pentru starea mediului și a componentelor sale este tot mai mare datorită imenselor pericole care amenință condițiile de viață pe planetă și însuși viitorul speciei umane.

Keywords: normative acts, duty, rights, environment, protection, satisfactory conditions, danger, consequences, society.

Cuvinte cheie: acte normative, îndatorire, drepturi, mediu înconjurător, protecție, condiții satisfăcătoare, pericol, consecințe, societate.

Realizând o retrospectivă în istorie, putem menționa că drepturile au apărut concomitent cu îndatoririle. Existența acestora este determinată de conținutul oricărui raport juridic, deoarece drepturile subiective niciodată nu puteau fi exercitate în lipsa unor obligații juridice corelative. În virtutea acestei situații nici un individ nu se putea bucura doar de drepturi fără să-și asume îndatoriri respective.

Îndatoririle fundamentale, servind drept mijloc de realizare a drepturilor subiective mobilizează treptat oamenii la realizarea scopurilor societății [1, p. 505]. Îndatoririle fundamentale reprezintă acele obligații puse în sarcina cetățenilor, esențiale pentru buna organizare a vieții sociale, determinate de scopurile societății și de valorile sociale ocrotite și promovate de aceasta, consacrate în norme de drept, care constituie conținutul normativ al Constituției, a căror respectare este asigurată prin forța de constrângere a statului atunci când convingerea nu este suficientă [2, p. 278].

Îndatoririle fundamentale apar ulterior conceptului de drepturi fundamentale, urmând apoi să

fie consacrate în acte deosebite. Existența unor îndatoriri fundamentale este stipulată și în Declarația Universală a Drepturilor Omului [3], unde se arată că „orice persoană are îndatoriri față de colectivitate, deoarece numai în cadrul acesteia este posibilă dezvoltarea liberă și deplină a personalităților sale în exercitarea drepturilor și libertăților sale fiecare om este supus decât numai îngrădirilor stabilite prin lege, exclusiv în scopul de a igura cuvenita recunoaștere și respectare a drepturilor și libertăților și ca să fie tisfăcute justele cerințe ale moralei, ordinii publice și bunăstării generale într-o ietate democratică”.

Nici Declarația Franceză a Drepturilor Omului și Cetățeanului din 1789 [4], nu cuprinde prevederi referitoare la îndatoririle fundamentale ale cetățenilor. În aceste condiții, în Franța în 1848 apare o declarație care proclamă nu numai drepturi, ci și îndatoriri fundamentale cetățenești [5, p. 329].

Drepturile subiective nu pot fi exercitate fără a fi corelate cu obligațiile juridice, deoarece aceste două componente alcătuiesc conținutul oricărui raport

juridic. Astfel, pornind de la aceste considerente, constatăm că îndeplinirea îndatoririlor fundamentale formează mijlocul prin care se realizează drepturile subiective, prin care oamenii contribuie la realizarea scopului și sarcinilor societății în ansamblu [6, p. 368].

Omul, respectiv societatea umană, în funcție de anvergura activității economice pe care o desfășoară, intră în relații mai mult sau mai puțin intense și complexe cu mediul, cu efecte negative mai mari sau mai mici asupra acestuia [7, p. 221]. Istoria, însă, consemnează destul de târziu aderența dreptului la ocrotirea naturii. Primele elemente de reglementare ale mediului, căutau să ocrotească sănătatea omului prin combaterea poluării resurselor locale esențiale, precum apa potabilă, aerul, fauna și flora [8, p. 4].

Potrivit izvoarelor istorice, în anul 242 î.e.n. în India împăratul Asoka a dispus prin lege ocrotirea peștilor, animalelor terestre și a pădurilor. A înființat și un fel de rezervații naturale, pe teritorii relativ întinse. În Roma Antică, de exemplu, poluatorii râurilor erau urmăriți de către riveranii din aval și de autoritățile publice. În secolul al V - lea oamenii se plâneau că Tibrul era serios poluat prin deșeurile orașului și protestau contra mirosurilor ce veneau de la unele locuințe. La Atena, în aceeași perioadă istorică, „poluatorii” epocii (tăbăcarii, fabricanții de brânzeturi și de miere) erau îndepărtați în afara orașelor și consemnați în locuri special amenajate, iar „măslinul sacru” era special ocrotit [8, p. 4].

După aproape un mileniu, marele han mongol Kibilay (1214-1294) a interzis vânatoarea păsărilor și mamiferelor pe perioada de reproducție [9, p. 296].

Mari gânditori, precum Platon, deplâneau despăduririle masive ale munților din motive economice, iar Hippocrates în „Tratat despre aer, apă și locuri”, sublinia că bunăstarea individului este puternic dependentă de mediu. Acestea au fost doar începuturi timide, deoarece preocupările dreptului privitoare la mediu au luat avânt după anul 1000, datorită situației îngrijorătoare față de degradarea naturii (pădurea și fauna sălbatică) [8, p. 4].

În evul mediu, regii, principii, ducii și alți proprietari, ocroteau peisaje și sălbăticiuni de pe teritoriul pe care îl stăpâneau. Motivația era de natură estetică. În Anglia, în secolul XIV, regele Eduard a dat prima lege împotriva poluării. Se interzicea prin aceasta folosirea cărbunelui la încălzirea locuințelor în Londra. În Polonia, în secolul XVI, regele Sigismund al III-lea a declarat zone protejate, teritoriile pe care trăiau zimbrii. Primele măsuri de protecție, în secolele XVII și XVIII, au vizat pădurile, vânatul și pescuitul. În 1810, Napoleon I, a emis primul act normativ (decret imperial), cu caracter științific vizând organizarea teritorială a protecției mediului. În decret se reglementa amplasarea industriilor după gradul lor de toxicitate. Primele rezervații pentru ocrotirea animalelor sălbatice, în accepțiunea actuală a noțiunii, au apărut în a doua jumătate a secolului XIX în Franța (1861), după care s-au generalizat în întreaga lume. Pe măsura dezvoltării economice în Europa de Vest și SUA, s-a pus tot mai insistent problema punerii sub scutul legii nu numai a anumitor rezervații și parcuri naționale de interes

științific general, ci și a tuturor elementelor mediului, în accepțiunea modernă. Adaptarea legislației la cerințele protecției mediului a necesitat și necesită acțiuni internaționale. Obligația de a ocroti mediul a devenit, în ultimele decenii o problemă majoră, recunoscută de toate statele lumii [10, p. 400].

În atitudinea individuală și colectivă a oamenilor față de obligația de a ocroti mediul, s-au înregistrat trei etape: a) până la sfârșitul secolului XIX; b) de la începutul secolului XX până la sfârșitul anilor 60 ai sec. XX și c) începând cu deceniul VII al secolului XX și până în prezent. Până la sfârșitul secolului XIX, datorită numărului mai mic de oameni și a nivelului mai scăzut de dezvoltare a științei și tehnicii, activitatea economică a societății umane a fost mai redusă, impactul acesteia asupra naturii trecând practic neobservat, fiind puțin nociv. În acest context, obligația de a ocroti mediul aveau mai mult o semnificație estetică, o valoare economică generală. De la începutul secolului XX, până la sfârșitul anilor 60 ai sec. XX, s-au înregistrat modificări profunde în raporturile societății umane cu mediul. Aceste modificări au fost consecința exploziei demografice și a revoluției tehnico-științifice înregistrată în industrie, agricultură, transporturi, urbanizare și științele biologice, care au supus mediul unei presiuni din ce în ce mai mare sub raportul resurselor regenerabile și a poluării. Fenomenele negative au fost sesizate la început de oamenii de știință, apoi de opinia publică, care s-a organizat în mișcări și partide ecologiste, de organisme internaționale științifice și economice și de guvernele diferitelor țări. În această etapă, poluarea mediului a devenit evidentă, fiind apreciată ca un pericol incontestabil, ce amenință, oamenii și însăși natura, cu efecte negative asupra ciclurilor de producție. Începând cu anul 1940, s-au conturat reperele fundamentale ale concepției actuale vis-a-vis de protecția mediului, prin adoptarea Convenției de la Washington din 12 octombrie 1940, ale căror clauze prevedeau conservarea florei și faunei [11, p. 294].

La 10 decembrie 1948, Adunarea Generală a O.N.U. a adoptat Declarația Universală a Drepturilor Omului, care în art. 3 și 25 abordează la general unele probleme ecologice referitoare la dreptul la viață într-un mediu protejat, dreptul ființei umane de a avea un nivel de trai corespunzător etc. Începând cu deceniul al VII-lea al secolului XX și până în prezent, fenomenele negative s-au accentuat, ca urmare a sporirii în continuare a nivelului activității economice.

În acest context, a apărut pericolul iminent de epuizare a resurselor de materii prime și energie, fapt care pune în pericol procesele de producție fundamentale ce asigură existența societății omenești. Către anul 1960, a debutat perioada de conștientizare a necesității protecției mediului natural, perioadă care atinge apogeul odată cu adoptarea Strategiei Mondiale a Conservării Naturii în 1980. În acest context, se cere menționat și Actul final de la Helsinki din 1 august 1975, în care se declară că succesul unei politici a mediului presupune ca toate categoriile de populație și toate forțele sociale, conștiente de responsabilitățile lor, să contribuie la protejarea și ameliorarea mediului natural, ceea ce implică o acțiune educativă continuă și

aprofundată, în special, în privința tineretului. O gândire durabilă în scopul protecției mediului, și o dezvoltare vertiginoasă a legislației ecologice apare doar odată cu organizarea de către Națiunile Unite a două conferințe internaționale - cea de la Stockholm din 1972 și cea de la Rio de Janeiro din 1992, ce au avut ca obiect protecția mediului [12, p. 78].

Interesul pentru problemele de mediu a apărut mult mai târziu, și anume, în anul 1972 în cadrul primei Conferințe Mondiale a Națiunilor Unite organizată la Stockholm. Aceasta a fost prima conferință mondială în domeniul protecției mediului, la care au participat delegați din 114 state. După cum se știe [13, p. 18], cel mai important document adoptat în cadrul Conferinței este reprezentat de „Declarația asupra mediului înconjurător”, în cadrul căreia s-a stabilit un număr de 26 de principii privind drepturile și obligațiile statelor în acest domeniu și mijloacele de dezvoltare a cooperării internaționale. Importanța documentului constă în faptul că se afirmă explicit, pentru prima dată, legătura dintre protecția mediului și drepturile omului. Astfel, Principiul 1 al documentului precizează că „Omul are dreptul fundamental la libertate, egalitate și condiții de viață satisfăcătoare, într-un mediu a cărui calitate îi permite să trăiască în mod demn și în prosperitate. El are datoria sacră de a proteja și îmbunătăți mediul înconjurător pentru generațiile prezente și viitoare (...)” [14, p. 62]. Documentul stabilește o legătură între drepturile omului și protecția mediului, calitatea acestuia din urmă fiind un factor esențial pentru asigurarea unor condiții de viață satisfăcătoare, dar, cu toate acestea, nu recunoaște în mod direct un drept la mediu. Un alt element de noutate este acela că prin acest document s-au pus bazele dezvoltării dreptului internațional al mediului [15, p. 99].

În perioada dintre Conferința de la Stockholm din 1972 și cea de la Rio de Janeiro din 1992, s-a adoptat Strategia Mondială a Conservării Naturii, în baza căreia s-a realizat o separare între vechile concepții, conform cărora dezvoltarea avea drept consecință poluarea și degradarea mediului și s-a început a pune suportul unei economii ecologice. De asemenea, în acest răstimp a fost adoptat un document internațional deosebit, și anume Carta Mondială a Naturii, care în principiul 1 susține că „natura trebuie respectată, iar procesele esențiale ale acesteia nu trebuie afectate”.

În contextul sporirii eforturilor naționale și internaționale, în scopul promovării și dezvoltării unui mediu sănătos în toate țările, Adunarea Generală a O.N.U. din 22 decembrie 1989 a lansat apelul la o înțelegere globală, care să definească strategia pentru stoparea efectelor degradării mediului. Inițiativa fiind lansată, a avut sorți de izbândă, ca în Ziua Mondială a Mediului din 1992 să aibă loc cea de a doua Conferință a Națiunilor Unite pentru Mediu și Dezvoltare de la Rio de Janeiro, conferință care a avut drept scop elaborarea strategiilor și măsurilor de combatere a degradării mediului pe plan internațional. Declarația de la Rio [16], pune accentul pe dezvoltarea durabilă și proclamă în principiul 1 dreptul omului la o viață sănătoasă și productivă, în armonie cu natura.

De asemenea, la această conferință s-au adoptat și alte documente nu mai puțin importante: Convenția

privind diversitatea biologică; Convenția privind schimbările climatice; Declarația privind pădurile; Declarația privind deșertificarea și Agenda 21. În perioada dintre Conferința de la Rio de Janeiro din 1992 și cea de la Johannesburg din 26 august - 4 septembrie 2002, s-a adoptat de către Organizația Națiunilor Unite - Convenția privind accesul la informație, justiție și participarea publicului la adoptarea deciziilor în domeniul mediului, document de o importanță inestimabilă în domeniu, ce reglementează participarea populației la luarea deciziilor în domeniul mediului; accesul la informație și justiție pe o problemă sau alta de mediu [17, p. 315].

Protocolul adițional al Convenției Americane a Drepturilor Omului, adoptat la San Salvador la 17 noiembrie 1998, privind drepturile economice, sociale și culturale, în art. 11 alin. 1 recunoaște dreptul la un mediu sănătos, precizând că „fiecare are dreptul de a trăi într-un mediu sănătos și de a beneficia de serviciile publice esențiale”, dar și obligația statelor de a „promova protecția și ameliorarea mediului” (art. 11 alin. 2) [18].

Protecția mediului constituie una cele mai importante preocupări ale societății contemporane, care a conștientizat faptul nu mai poate să se dezvolte în detrimentul mediului ambiant. De la începutul anilor '70, au început acțiuni internaționale de protejare a mediului și a naturii, acesta fiind momentul în care s-a recunoscut că există o criză ecologică mondială. Pot fi exemplificate marea neagră, accidente nucleare, ploile acide care au distrus pădurile Europei de Nord, distrugerea pădurilor tropicale, epuizarea stratului de ozon, pericole majore pentru populația globului [19].

Protecția mediului reprezintă ansamblul reglementărilor, măsurilor și acțiunilor care au ca scop menținerea, protejarea și îmbunătățirea condițiilor naturale de mediu, precum și reducerea poluării mediului și a surselor de poluare. Îngrijirea pentru starea mediului și a componentelor sale este tot mai mare datorită imenselor pericole care amenință condițiile de viață pe planetă și însuși viitorul speciei umane. Efectele crizei ecologice sunt globale, deoarece deteriorările de mediu nu cunosc frontiere, consecințelor lor se răspândesc pe suprafețe întinse.

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MATHEMATICAL SCIENCES

BY DIRECTING A DOUBLE INTEGRAL TO A REPEATED PROOF, CERTAIN INEQUALITIES

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ДОКАЗАТЕЛЬСТВО НЕРАВЕНСТВО С ПРИВЕДЕНИЕМ ДВОЙНОГО ИНТЕГРАЛА К ПОВТОРНОМУ ИНТЕГРАЛУ

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Abstract

In this paper we consider some important integral inequalities. The integral function is given some conditions and proves a very important inequality. In addition, the substitution under the conditions under which inequality will change will remain in force. Conditions subintegral function when it changes with other conditions the inequality changes its sign to the inverse. In the solution, the substitution of the problem was the product of two simple integrals in the form of a double integral.

Аннотация

В статье рассматриваются некоторые важные интегральные неравенства. Под интегральной функции возложено некоторые условия и доказано очень важное неравенство. Кроме этого подставленное подинтегральное условия когда поменяется неравенство остается в силе. Условия подинтегральной функции когда поменяется с другими условиями неравенство поменяет свой знак обратному. В решение подставленные задачи были использованы произведение двух простых интегралов в виде двойного интеграла.

Keywords: double, inequality, integral, integrand function.

Ключевые слова: двухкратный, неравенство, интеграл, подинтегральное функции.

Имея очень долгую историю теоретического изучения и практического применения неравенств, они широко используются в современной математике, особенно в сравнениях, приближенных вычислениях, теории приближений. Известно, что при обучении и доказательстве многих задач классической высшей математики; классические неравенства используются в теории пределов, рядов, при нахождении экстремума и условного экстремума функции. Решение ряда приближенных задач основано на приближенных методах и работе над неравенствами. Нахождение приближенного решения экстремальных задач современной математики и решение многих классических задач дается только с помощью неравенств.

Вычисление двойного интеграла повторным интегрированием показано в [2]. Кроме того, здесь доказываются основные свойства двойного интеграла: так, в области σ

$$\text{когда } f(x,y) \geq 0, \iint_{\sigma} f(x,y) d\sigma \geq 0,$$

$$\text{когда } f(x,y) \leq 0, \iint_{\sigma} f(x,y) d\sigma \leq 0,$$

может. Линейная комбинация функций $f(x,y)$ и $g(x,y)$, интегрируемых в области σ , также интегрируется в этой области, и равенство верно для постоянных чисел α, β .

$$\iint_{\sigma} [\alpha f(x,y) dx dy + \beta g(x,y) dx dy] = \alpha \iint_{\sigma} f(x,y) dx dy + \beta \iint_{\sigma} g(x,y) dx dy$$

В особом случае

$$\iint_{\sigma} \alpha f(x,y) dx dy = \alpha \iint_{\sigma} f(x,y) dx dy$$

То есть постоянный множитель можно вынести за знак двойного интеграла.

В [3] дано вычисление функции $f(x,y)$, проинтегрированной в прямоугольной области $\sigma = \{a,b,c,d\}$. Если $\sigma = \{a,b,c,d\}$ для функции $f(x,y)$, определенной в прямоугольной области

$$\iint_{\sigma} f(x,y) d\sigma \tag{1}$$

двойной интеграл при каждом фиксированном значении x , взятом из $[a,b]$.

$$J(x) = \int_c^d f(x, y) dy \quad (a \leq x \leq b)$$

если имеет определенный интеграл, то

$$\int_a^b dx \int_c^d f(x, y) dy$$

также существует повторный интеграл и

$$\iint_{\sigma} f(x, y) d\sigma = \int_a^b dx \int_c^d f(x, y) dy$$

равенство верно. Если мы поменяем роли переменных x и y и предположим, что для постоянной переменной y если есть интеграл

$$\int_a^b f(x, y) dx$$

тогда

$$\iint_{\sigma} f(x, y) d\sigma = \int_c^d dy \int_a^b f(x, y) dx$$

равенство верно. Если (1) вместе с двойным интегралом они имеют простые интегралы

$$\int_c^d f(x, y) dy \quad (x = \text{const}) \quad \forall \int_a^b f(x, y) dx \quad (y = \text{const})$$

тогда

$$\int_a^b dx \int_c^d f(x, y) dy = \int_c^d dy \int_a^b f(x, y) dx$$

равенство верно.

Легко можно показать, что

$$\iint_{\sigma} f(x, y) d\sigma = \int_a^b dx \int_c^d f(x, y) dy = \int_c^d dy \int_a^b f(x, y) dx$$

равенство верно.

В частном случае, если $f(x, y) = f_1(x) \cdot f_2(y)$ то двойной интеграл по этому прямоугольнику равен произведению двух определенных интегралов:

$$\iint_{\sigma} f(x, y) dx dy = \left(\int_a^b f_1(x) dx \right) \cdot \left(\int_c^d f_2(y) dy \right).$$

Используя эти свойства двойного интеграла, докажем следующие неравенства.

Постановка задачи: если $p(x)$ - положительно интегрируемая монотонно убывающая функция, $g(x)$ - положительно интегрируемая монотонно возрастающая функция, $f(x)$ - монотонно возрастающая функция, тогда доказать неравенство:

$$\int_a^b p(x) f(x) dx \cdot \int_a^b g(x) dx \leq \int_a^b p(x) dx \cdot \int_a^b f(x) g(x) dx \quad (2)$$

Допустим, что $a < b$

$$E = \int_a^b p(x) dx \cdot \int_a^b f(x) g(x) dx - \int_a^b p(x) f(x) dx \cdot \int_a^b g(x) dx$$

посмотрим разницу.

При замене x на y во втором произведении обоих членов, эта разница показать как:

$$E = \int_a^b \int_a^b p(x) g(y) [f(y) - f(x)] dx dy \quad (3)$$

Если мы поменяем местами x и y получаем интеграл:

$$E = \int_a^b \int_a^b p(y) g(x) [f(x) - f(y)] dx dy \quad (4)$$

Если мы соберем утверждения (3) и (4) рядом, получим:

$$\begin{aligned} E &= \frac{1}{2} \int_a^b \int_a^b [f(x) - f(y)] [p(y)g(x) - p(x)g(y)] dx dy = \\ &= \frac{1}{2} \int_a^b \int_a^b [f(x) - f(y)] [p(y)g(x) + p(y)g(y) - p(y)g(y) - p(x)g(y)] dx dy = \\ &= \frac{1}{2} \int_a^b \int_a^b [f(x) - f(y)] \{p(y)[g(x) - g(y)] + g(y)[p(y) - p(x)]\} dx dy = \end{aligned}$$

$$= \frac{1}{2} \int_a^b \int_a^b p(y)[f(x) - f(y)][g(x) - g(y)] dx dy + \\ + \frac{1}{2} \int_a^b \int_a^b g(y)[f(x) - f(y)][p(y) - p(x)] dx dy$$

Так получим что,

$$\int_a^b p(x) dx \cdot \int_a^b f(x) g(x) dx - \int_a^b p(x) f(x) dx \cdot \int_a^b g(x) dx = \\ = \frac{1}{2} \int_a^b \int_a^b p(y)[f(x) - f(y)][g(x) - g(y)] dx dy + \\ + \frac{1}{2} \int_a^b \int_a^b g(y)[f(x) - f(y)][p(y) - p(x)] dx dy . \quad (5)$$

Поскольку $f(x)$ и $g(x)$ монотонно возрастают, а $p(x)$ монотонно убывает, выражения в обеих скобках в обоих интегралах имеют одинаковый знак; тогда по условию интегральные выражения неотрицательны. Значит, $E \geq 0$. Это и требовалось доказать.

Легко видеть, что неравенство верно и в том случае, если $f(x)$ и $g(x)$ монотонно убывают, а $p(x)$ монотонно возрастает.

Если $p(x)$ - положительно интегрируемая монотонно убывающая функция, $g(x)$ — положительно интегрируемая монотонно возрастающая функция, а $f(x)$ - монотонно убывающая функция, то она меняет знак неравенства, т.е.

$$\int_a^b p(x) f(x) dx \cdot \int_a^b g(x) dx \geq \int_a^b p(x) dx \cdot \int_a^b f(x) g(x) dx . \quad (6)$$

Поскольку $f(x)$ монотонно убывает, $g(x)$ положительно интегрируется и монотонно возрастает

$$\int_a^b p(x) dx \cdot \int_a^b f(x) g(x) dx - \int_a^b p(x) f(x) dx \cdot \int_a^b g(x) dx = \\ = \frac{1}{2} \int_a^b \int_a^b p(y)[f(x) - f(y)][g(x) - g(y)] dx dy + \\ + \frac{1}{2} \int_a^b \int_a^b g(y)[f(x) - f(y)][p(y) - p(x)] dx dy$$

В обоих интегралах в правой части уравнения выражения в обеих скобках имеют разные знаки, тогда по условию выражения под интегралом не положительны, что показывает справедливость неравенства (6).

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MEDICAL SCIENCES

DYSLIPIDEMIA AND OBESITY AS RISK FACTORS IN CARDIAC ARRHYTHMIAS DIAGNOSED BY HOLTER MONITORING ECG OR STANDARD ECG

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Abstract

Introduction: In 2019, approximately 18 million persons died because of cardiac diseases, accounting for 5% were cardiac arrhythmias. Dyslipidemia and obesity are the major risk factors in cardiovascular pathologies. According to the World Health Organisation (WHO), in 2016, 39% of people that are 18 years and older were overweight, obesity was identified in 13%. Body mass index can be divided in underweight, normal, overweight and obesity. Obesity can be subdivided in class 1, class 2, class 3 or severe obesity. Dyslipidemia can be hypercholesterolemia and hypertriglyceridemia. The aim of this article is to assess the relation between dyslipidemia, obesity and cardiac arrhythmias.

Materials and methods: The study was effectuated by retrospective analysis of 94 histories from January 2022 to January 2023 in the Institute of Cardiology, the Republic of Moldova. In total, 94 patients were diagnosed with cardiac arrhythmias. Depending on the diagnostic method there were established two groups: Holter monitoring ECG (Group 1), standard ECG (Group 2).

Results: After effectuated analysis there were observed that in Group I hypercholesterolemia were in 65.75% of cases, hypertriglyceridemia in 17.81%, but in Group II hypercholesterolemia in 66.67% and hypertriglyceridemia in 4.10%. Depending on BMI in Group I the most frequent grade was overweight found in 49.32% of cases, mild obesity in 39.73%, moderate obesity in 5.48%, morbid obesity in 2.74% and within normal limits in 4.11%. In Group II the overweight was in 53.38%, mild obesity in 28.57%, moderate obesity 14.28% and morbid obesity in 4.76%, but BMI within normal limits was not identified in this group.

Conclusions: Hypercholesterolemia, overweight and obesity are very important risk factors in developing cardiac arrhythmias. Hypertriglyceridemia was encountered less often than other risk factors previously studied.

Keywords: cardiac arrhythmia, obesity, overweight, hypercholesterolemia, hypertriglyceridemia.

Introduction

A cardiac arrhythmia can be defined as an irregular heartbeat that often can be asymptomatic [3]. But there are some patients that can complain pre-syncope, syncope, dyspnoea, palpitations, chest pain and anxiety [2]. There are two main groups of cardiac arrhythmias like supraventricular and ventricular. Supraventricular arrhythmias are classified in sinus tachycardia, focal, multifocal and macroreentrant atrial tachycardia, atrial fibrillation, atrioventricular junctional tachycardia, atrioventricular reentrant tachycardia [1]. Ventricular arrhythmias are classified in ventricular tachycardia, premature ventricular contractions, torsades de pointes, ventricular flutter and fibrillation [11]. According to the WHO, the most frequent cause of global mortality, approximately 32%, are cardiovascular pathologies [5]. In 2017, in Republic of Moldova, the prevalence of atrial fibrillation was 3% in patients older than 20 years old [7].

Only in 2019 18 million people died because of heart diseases, in which cardiac arrhythmia were accounting for 5% [5]. In 2016, 39% of persons that are older than 18 years old were overweight, but obesity

was identified in 13% of cases [6]. Body mass index (BMI) is equal to the ratio between height (meters) and body mass (kilogramme). BMI can be classified in underweight range, overweight and obesity [4]. Also obesity can be divided into class 1, class 2 and class 3 or morbid obesity [4]. Classification of dyslipidemia is based on two types of the imbalance of lipids and there are hypercholesterolemia, that can be prevailed by low-density lipoprotein cholesterol (LDL cholesterol) or high-density lipoprotein cholesterol, and another type is hypertriglyceridemia [8].

Aim of the study

Taking in the consideration that dyslipidemia and excessive weight are the major risk factors of cardiovascular diseases, the objective of the study is to assess the relation between obesity, dyslipidemia and cardiac arrhythmias. Also we considered that it was necessary to find out the relation between gender and dyslipidemia, excessive weight and cardiac arrhythmias.

Materials and methods

This study is based on retrospective analysis of 94 patient's medical records from January 2022 to January

2023 in the Institute of Cardiology, the Republic of Moldova. From 1589 patients hospitalized in the general cardiology department, we selected 94 patients based on the inclusion criteria: the diagnosis of cardiac arrhythmia, age more than 18 years. Patients without cardiac arrhythmias and age younger than 18 years were excluded. Group I are patients with cardiac arrhythmias confirmed by Holter monitoring ECG. Group II are patients with cardiac arrhythmias confirmed by ECG standard.

The classification of BMI is:

- 1) Underweight – <18 kg/m²
 - 2) Normal – 18.5-24.9 kg/m²
 - 3) Overweight – 25.0-29.9 kg/m²
 - 4) Obesity – >30.0 kg/m²
- Class I – 30.0-34.9 kg/m²
 - Class II – 35.0-39.9 kg/m²
 - Class III – >40 kg/m²

All patients' personal information remains confidential.

The obtained descriptive statistical results have been introduced in Microsoft Office Excel and Microsoft Office Word with charts and diagrams.

Results

The study analysed 94 patients with cardiac arrhythmias confirmed by Holter monitoring ECG or ECG standard.

Figure 1 shows the gender distribution of patients with cardiac arrhythmias, confirmed by Holter monitoring ECG or standard ECG. In both groups of effectuated study dominated male gender. In Group I, where cardiac arrhythmias were confirmed by Holter monitoring ECG, men were 53.42% and women in 46.58% of cases. But in Group II, where cardiac arrhythmias were confirmed by standard ECG, men were in 52.38% of cases and women in 47.62%.

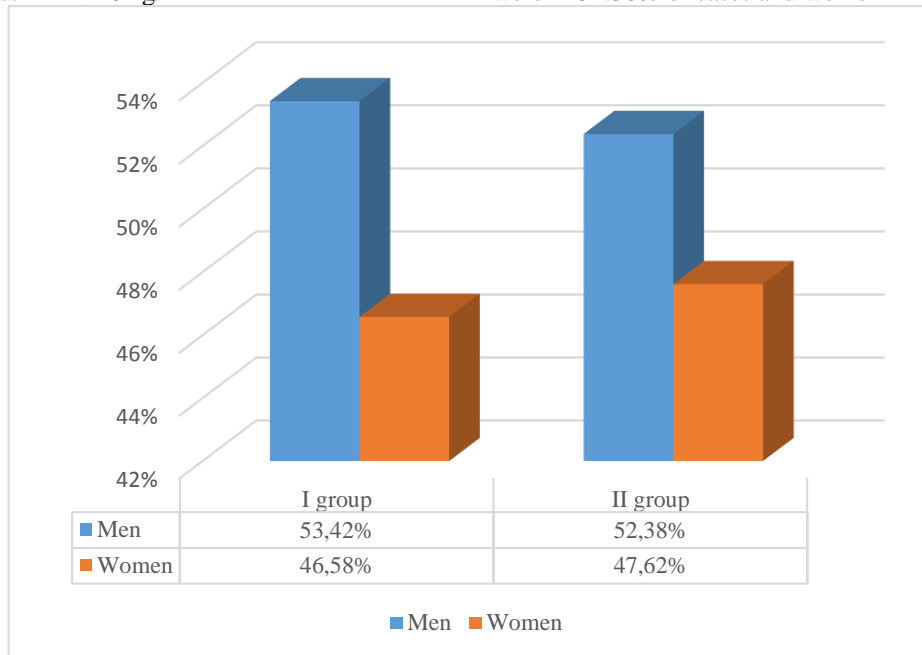


Figure 1. Patients' distribution according to gender.

Figure 2 shows the distribution of patients with cardiac arrhythmias according to the classification of obesity by BMI.

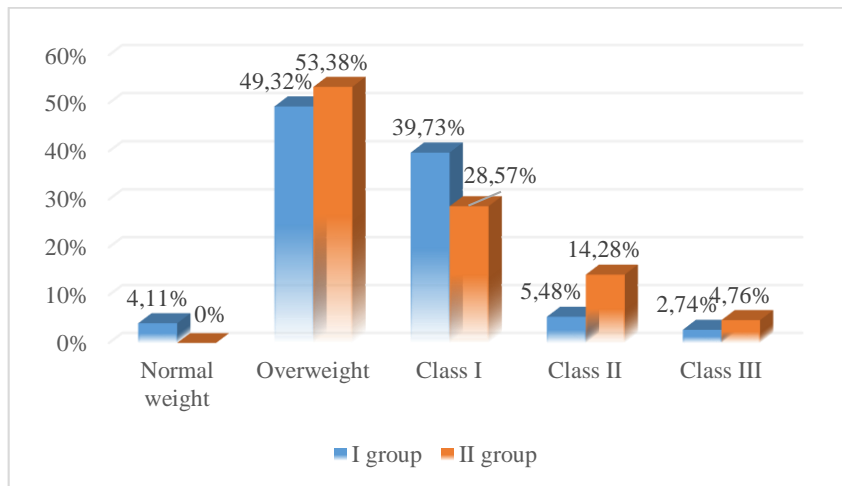


Figure 2. Patients' distribution according to BMI classification.

Normal weight was observed in Group I 4.11%, but in Group II 0%. In Group I overweight was

identified in 49.32% and Group II in 53.38%. Obesity class I was in Group I in 39.73% of cases and in Group

II in 28.57%. In Group I 39.73% and in Group II 28.57% had obesity class II. The severe obesity was identified more in Group II 4.76% and less in Group I 2.74%.

Figure 3 demonstrates the distribution of patients with cardiac arrhythmias according to dyslipidemia.

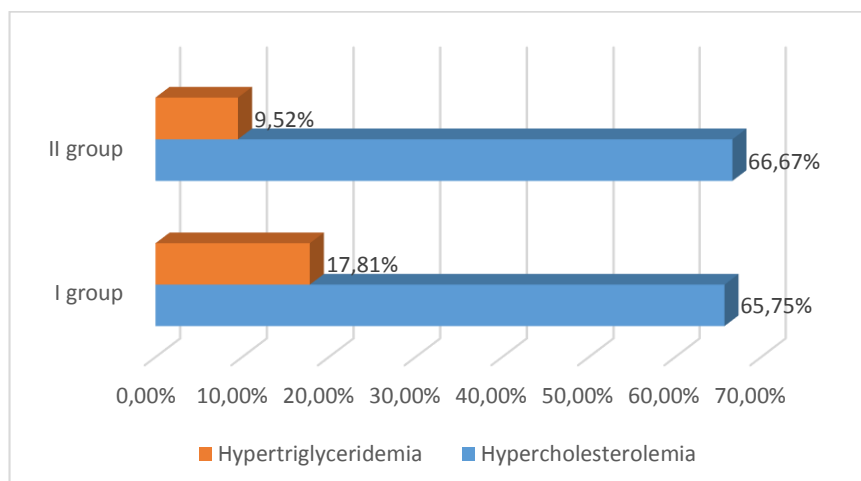


Figure 3. Patients' distribution according to types of dyslipidemia.

Hypercholesterolemia prevailed by LDL cholesterol, was observed in both groups. In Group I, where cardiac arrhythmias were diagnosed by Holter monitoring ECG, in 65.75% of cases and in Group II, where cardiac arrhythmias were diagnosed by ECG standard, in 66.67%. Hypertriglyceridemia was found in Group I in 17.81% of cases and in Group II of the study in only 9.52% of cases.

Discussions

In the study from 94 patients 53.19% were male gender and 46.81% female. These results match with results from a study from Nepal where male gender in 52.2% of cases and female gender prevailed in 47.8% of cases [43]. Normal weight was met in only 3.19% of cases from all patients, overweight and obesity were met in 96.81% of 94 patients. The meta-analysis, that included 51 studies and 600 000 patients determined the impact of overweight and obesity on atrial fibrillation [9]. The result was that incident of atrial fibrillation was increasing with 20-30% with every 5 point elevating in BMI [9]. In our study we demonstrated that from 94 patients 65.96% had hypercholesterolemia prevailed by low-density lipoprotein cholesterol and 15.96% had hypertriglyceridemia. In Helsinki was effectuated a study where participated 725 patients with cardiac arrhythmias [10]. In that study was observed that in 41.6% of cases was found hypercholesterolemia prevailed by LDL cholesterol and 22.1% was found hypertriglyceridemia [10].

Conclusions

1. Cardiac arrhythmias were observed more frequent in male gender – in 53.19% of cases.
2. Overweight and obesity were observed in 96.1% of patients with cardiac arrhythmias.
3. Hypercholesterolemia was found in 65.96% of cases and hypertriglyceridemia in 15.96% of cases.

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BLOOD COUNT ALTERATIONS IN COVID-19 PNEUMONIA

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Abstract

The COVID-19 pandemic represents a global crisis of the 21st century and one of the biggest challenges faced by society after the Second World War. Once it appeared in Asia, the virus spread to all continents. It has not only created crisis in health sector, but also caused devastating damage in the economic, political, social fields. Although more than 3 years have passed since the WHO reported the new virus, the pandemic has not regained its end due to mutagenic character, insufficient vaccination and symptoms with multiorgan damage.

Keywords: virus, COVID-19 pandemic, pneumonia, blood changes

Introduction

In early December 2019 in the city of Wuhan, the capital of China's Hubei province, several cases of pneumonia of unknown origin were identified. The pathogen of this infection, officially named on 11.02.2020 SARS-Cov-2 „ Severe Acute Respiratory Syndrome Coronavirus 2”, represents an RNA virus, β coronavirus[3,4]. The final diagnosis for COVID-19 pneumonia is made using an X-ray, but blood changes are also important, from the simplest changes (increased inflammatory markers) to leukopenia, trombocytopenia requiring transfer to specialized departments with mechanical ventilation .

Aim of the study

Due to the fact that COVID-19 is a continuing threat to people's lives caused by a delayed approach to

its prevention, diagnosis and treatment, we aimed to identify the first changes in blood tests that occur and can be the trigger pillars of a fatal cascade.

Materials and methods

The study included 80 patients with the diagnosis of COVID-19 Pneumonia, treated in the General Therapy department of the „Sfântul Arhanghel Mihail” Clinical Hospital, Republic of Moldova, during the years 2020-2021. The COVID-19 Pneumonia developed more frequently in men 47(59%), compared to women- 33(41%). The database of the selected material was processed statistically using Microsoft Excel.

Results and discussions

Following the analysis of patient observation records, a prevalence was observed among women aged 61-70 years, among men aged 51-70(Figure 1).

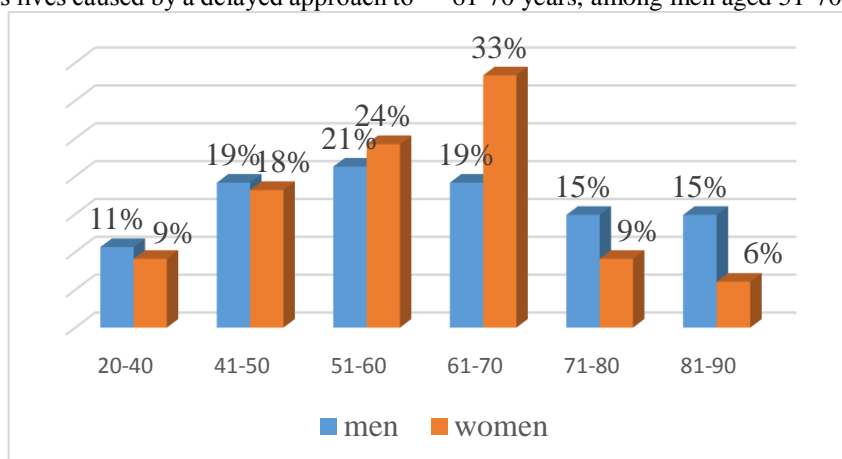


Figure 1. Distribution of COVID-19 Pneumonia patients according to age

Analyzing the blood count, we note that the level of leukocytes undergoes various changes during the hospitalization of patients, depending on the severity of the disease. Most patients at admission had the level of leukocytes in the norm, then their decrease in mild forms occurred. Leukopenia in many centers was the primary differentiation indicator of COVID-19 pneumonia and non-COVID pneumonia. In some patients, however, after 4-7 days after admission, the level of

leukocytes was elevated, on account of neutrophils (Figure 2)[6]. These changes were mainly determined in elderly patients with comorbidities and increased risk of mortality, who needed transfer to specialized ICU departments. Those with milder forms of COVID-19, 13 (16%) patients experienced mild leukopenia. Other changes that were predictors of the need for special care were patients with anemia - Hb, low erythrocytes and hematocrit levels, lymphocytopenia and

thrombocytopenia. In 12(15%) of patients, serum ferritin with moderately elevated levels was identified, correlated with lactacidemia of 4 (5%) of them, subsequently developing ARDS and being placed in centers with ATI. At the same time, it was shown that these patients suffer a certain degree of decompensated tissue

hypoxia, which coordinated the doctors to study the clinical signs at the neurological level, to determine the degree of CNS damage correlated with the level of ferritin in the blood. It was determined of those 12 patients with elevated ferritin, headache was recorded in all.

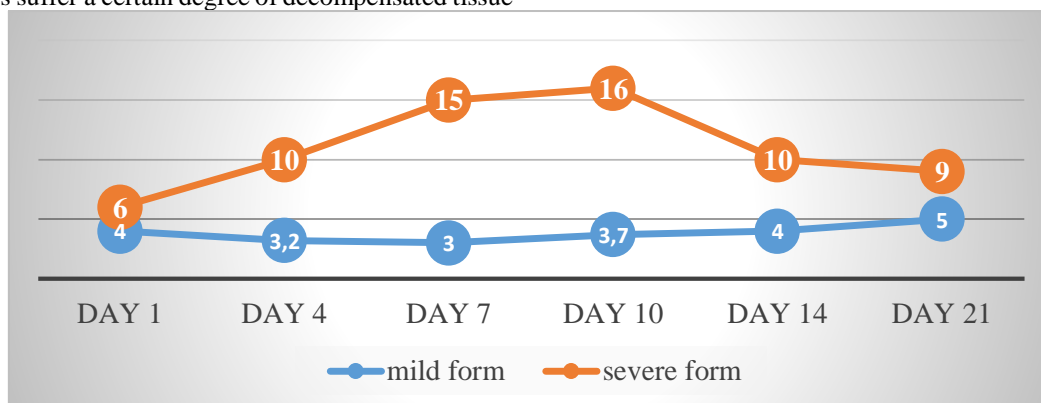


Figure 2. Dynamics of leukocytes changes during hospitalization

Another changed indicator in COVID-19 pneumonia is the level of eosinophils. Comparing the analyzes of patients with bilateral pneumonia and those with unilateral pneumonia, more marked eosinopenia is observed in those with bilateral damage[7]. The level of inflammatory markers is determined increased to ESR, C-reactive protein, procalcitonin. The biochemical markers also underwent changes, the elevation of the hepatic markers: ALAT and ASAT, the level of bilirubin, as well as the renal ones: serum creatinine and urea.

Blood glucose level is also changed. 1/3 of the patients were admitted with the glucose level at the upper limit of the norm, then during hospitalization were observed elevations of blood glucose, another 2/3 of the patients were admitted with increased blood glucose and during the evolution of the pathology collided with risky increases of glucose, which significantly increases the risk of mortality, as well as the use of insulin, more beneficial is the administration of metformin[2,5].

Table 1

Number of patients (total=30)	Glycemia on admission (mmol/l)	Glycemia during hospitalization (mmol/l)
8	5-6,5	7-8,5
22	10-11	14-16

The increase in D-dimers is correlated with IL-2R on Day 5, IL-6, and C-reactive protein on day 10. At the same time, the association between the elevation of D-dimers, APTT, ALAT/ ASAT, CRP, fibrinogen, LDH ,

PT, CBC(platelets and lymphocytes in acute phases) and the decrease of albumin, fibrinogen and PT in late phases, may lead to increased risk of venous thromboembolism in COVID-19[1].

Changes identified in laboratory tests

Changes	Number of patients (percentages)
Anaemia	24(30%)
Leukocytosis	24(33%)
Leukopenia	13(16%)
Thrombocytopenie	43(54%)
Lymphocytopenie	32(40%)
Neutrophilia	22(33%)
Eosinopenia	10(13%)
VSH ↑	80(100%)
PCR ↑	78(98%)
Feritin ↑	12(15%)
Lactic acid ↑	4(5%)
Hyperglycaemia	30(38%)
Fibrinogen ↑	34(43%)
D-dimeri ↑	45(56%)
INR ↑	12(15%)
ALAT ↑	6(8%)
ASAT ↑	10(13%)
Bilirub ↑	8(10%)
Cholesterol ↑	16(20%)
Triglycerides ↑	14(18)
Creatinine ↑	4(5%)
Uree ↑	5(6%)
Procalcitonin ↑	17(21%)

Conclusions

Patients with mild forms of the COVID-19 pneumonia have leukopenia, increased inflammatory markers, moderate hyperglycemia, while patients with severe forms have leukocytosis, thrombocytopenia, anemia, changes in coagulogram and blood biochemistry with developing kidney, liver, heart failure, patients who subsequently will require care in ICU departments.

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**EARLY DIAGNOSIS OF SERONEGATIVE SPONDYLITIS: DIFFICULTIES AND ERRORS
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Almaty City Rheumatological Center***Kurmanova G.,***Kazakh National university named after Al-Farabi***Amir A.K.***Kazakh National medical university named after S.D. Asfendiyarov*[DOI: 10.5281/zenodo.7747223](https://doi.org/10.5281/zenodo.7747223)**Abstract**

Early diagnosis of seronegative spondyloarthritis, in the absence of radiological signs, is a problem not only for primary care physicians but even for an experienced specialist in the field of rheumatology, as some infectious diseases, for example, chronic brucellosis may debut with similar clinical manifestations, complicating diagnosis and treatment. This article reports on the clinical case of a patient who was previously diagnosed with early seronegative spondyloarthritis and was treated in accordance with the latest recommendations to no avail. As a result, the patient's condition deteriorated in dynamics. We are analyzing this case to identify the difficulties of diagnosis and the causes of the error that led to the temporary disability of the patient.

Keywords: seronegative spondyloarthritis, chronic brucellosis, early diagnosis.

Introduction: In the last few decades, notions about seronegative spondyloarthritis (SpA) have changed significantly and new diagnostic criteria have appeared (ASAS, 2009 and 2012) based on two main diagnostic criteria: the presence of a genetic marker – HLA B27 and sacroiliitis confirmed by MRI or radiography. But as practice shows, the presence of these criteria did not help clinicians in the early diagnosis of SpA in the endemic brucellosis zone. Early diagnosis and detection of brucellosis in people whose profession is not related to animal husbandry remains a problem. At the same time, a timely diagnosis and adequate therapy, will help to avoid the process of transition to a chronic form and the development of long-term disability and invalidity.

Case: a 46-year-old woman complained of pain and movement restrictions in the cervical spine, the intensity does not depend on the time of day, pain and swelling of the right elbow joint, aching bones and muscles, severe sweating, especially in the palms, anxiety up to panic attacks, menstrual cycle disorders, fatigue. The patient has been ill for 2 years, the onset of the disease with pain and restriction of movement in the right shoulder joint, severe sweating, wave-like fever at night, up to a maximum of 38°C with periods of chills and loss of 5 kg. Several times she received courses of antibacterial therapy with a temporary positive effect. Complete blood count (CBC): leukocytes – $4.42 \times 10^9/l$, platelets – 63 per microliter of blood, hemoglobin – 131 g/l, neutrophils – 22.1%, lymphocytes – 65%, ESR – 19 mm/h; a slight increased liver transaminases: ALT — 142 U/L at a rate of 32 U/L, AST 40 U/L at a rate of 31 U/L.

After 3 months, the patient started complaining to pain and movement restrictions in the cervical spine (CS), thoracic spine (ThS), lumbosacral spine (LSS), pain throughout the circumference of the chest associated with the act of breathing, was treated with topical nonsteroidal anti-inflammatory drugs (NSAIDs) with a

temporary effect. Further, the pain in the LSS intensified with irradiation to the legs, subfebrile fever persisted. There was a single episode of stomatitis.

Considering fever, stomatitis and progression of articular syndrome, the presence of anemia (hemoglobin decreased to 98 g/l), low platelet level (152 per microliter of blood), high ESR (51 mm/hour), CRP (60 mg/ml) and a history of missed abortion in anamnesis (2017 y.), the patient was examined for systemic connective tissue diseases: ANA – negative, ANCA – negative, anti-CCP – negative, anti-ds DNA – negative, antiphospholipid antibodies – negative, anti-Cardiolipin IgG/IgM – negative, anti- β 2-glycoprotein IgG/IgM – negative. Passed infection tests: ELISA on chlamydia IgG/IgM — negative, ureaplasma IgG/IgM — negative, mycoplasma IgG/IgM — negative, yersiniosis IgG/IgM — negative. Twice the patient was tested for brucellosis in different laboratories: Huddleson's agglutination test – 2+, Wright agglutination test – 1:100, but the results of these tests were ignored. Lymphocytosis in blood tests (48.9-36%) persisted. She passed blood tests for parasitic and fungal infections: *Ascaris lumbricoides* IgG – negative, *Aspergillus fumigatus*, IgG – negative, *Giardiasis* IgG – positive, IgA – doubtful, *Opistorchis* IgG/IgM – negative, *Toxocara* IgG – negative, *Trichinella* IgG – negative, *Echinococcus* IgG – negative. Protein electrophoresis (protein fractions) showed dysproteinemia due to an increase in α 1 (6.3%) and β 2 (6.7%) fractions. The patient underwent an MRI of all parts of the spine: MRI of CS revealed signs of posterocentral herniated intervertebral discs (IVD) at levels C5-C6, C6-C7, IVD protrusion C4-C5. There were not any changes on the MRI of ThS. On MRI of LSS shows signs of IVD protrusion at levels L2-L3, L4-L5, L5-S1. She passed an analysis for genetic typing of the HLA B27 antigen, the result was positive, but no pathology was detected on radiography of the sacroiliac joints. Rheumatologist at the place of residence diagnosed «Seronegative spondyloarthritis» and recommended methylprednisolone 8 mg/day, sulfasalazine

2000 mg/day and celecoxib 120 mg/day with some improvements. Then she was examined by another rheumatologist and diagnosed «Dorsopathy, widespread spondyloarthritis, multiple protrusions of intervertebral discs, vertebrogenic pain syndrome, radicular pain syndrome» and recommended NSAIDs, chondroprotectors and muscle relaxants, with a temporary positive insufficient effect. Due to the insufficient positive effect, the patient was consulted by a rheumatologist at her place of residence and diagnosis was changed to «Ankylosing spondylitis (AS), HLA B27 associated, early stage, peripheral form» and the patient was prescribed anti-cytokine therapy: TNF- α inhibitor – golimumab 50 mg, once monthly. After 6 months of pathogenetic therapy, the patient complained of pain and swelling of the left knee joint, synovitis was detected on ultrasound of the knee joint. Pain in the ThS also progressed, severe sweating and pain in the LSS persisted, but without symptoms of radicular syndrome. The MRI of the ThS was repeated: the picture of osteochondrosis of the ThS. MRI of the LSS revealed circular protrusions of the IVD between L4-L5, L5-S1, as

well as aseptic spondylitis of the L5-S1 bodies (Figure 1), osteoarthritis of the ileosacral articulation (ISA). 1,5 years ago, the patient was consulted by this rheumatologist to clarify the diagnosis and determine the tactics of treatment, as back pain persists, a picture of bursitis in the right elbow joint joined, pronounced sweating persisted. **Epidemiological history:** the patient lived in the village until she was 16 years old, where she consumed homemade milk and cattle meat. This can be considered as a re-infection.

Materials and results: an objective assessment revealed hyperhidrosis of the palms, dermatographism of the skin. Bone and joint system: the act of compressing the brushes is complete, the compression force is not reduced. Pain and swelling of the right elbow joint. Tomayer test is negative, Kushelevsky type I/II/III tests are negative, Forestier's test is negative. Moderate restriction of movement in the cervical spine. Physical examination of internal organs revealed no pathology. respiratory rate 16 per min, heart rate 85 per minute, pulse 85 per minute, blood pressure 110/70 mm.Hg.

Table №1

Laboratory parameters of the patient in dynamics

Parameters	15.02.2021 (before treatment)	06.03.2021 (during treatment)	25.03.2021 (immediately after the 1st course of treatment)	22.05.2021 (before the start of the 2nd course of treatment)
Hemoglobin, г/л	142	131	123	128
Erythrocytes, 10*12	4,41	4,3	4,07	4,32
Platelets, 10*9	356	234	228	241
Leucocytes, 10*9	6,68	7,5	6,48	6,3
Lymphocytes, %	31,8	43,6	43	43,82
ESR, мм/час	52	16	20	14
CRP, мг/л	6,4	2,8	1,5	3,8
RF	negative	negative	negative	negative
HLA B27 (ELISA and immunoblotting)	not detected	-	-	-
determination of antigen-binding lymphocytes of brucellosis specificity	negative	-	-	-
Wright 's Agglutination Reaction	negative	-	negative	-
Reaction Agglutination reaction on glass (Huddleson)	postive	-	negative	-
ELISA brucellosis IgG	positive	-	-	positive
ELISA brucellosis IgM	negative	-	-	positive
ELISA brucellosis IgA	negative	-	-	negative

Repeated analysis for HLA B27 by specific hybridization based on fluorescent amplification and immunoblotting showed a negative result. The patient received anti-cytokine therapy, therefore, before starting antibacterial therapy, she submitted an immunogram before starting therapy and after the end of the 1st course of treatment (Table №2).

Table №2

Immunogram of the patient before and after treatment of brucellosis infection

Parameters	Before treatment	After treatment	Normal range
Immunogram (Humoral immunity IgA,IgM,IgG)			
IgA		2,33	
IgG		9,15	
IgM		0,71	
Immunogram (Cellular Immunity)			
T-lymphocytes (CD3)	52,01	65% (1.934)	52-76% (0.95-1,8)
B-lymphocytes (CD 20)	23,12	20% (0.600)	6-18% (0.15-0,40)
T-lymphocytes T-helpers (CD4)	58,33	29% (0.870)	31-46% (0.57-1,1)
Cytotoxic T-lymphocytes (CD8)	22,12	38% (1.140)	23-40% (0.45-0,85)
Immunoregulatory index (II) (CD 4/CD8)	2,6	0.8	1.2-2.0
Natural killers, NK cells (CD16+56)	21,31	13% (0.390)	9-19% (0.18-0,42)
Conclusion:	Increased B-lymphocytes. And also increased the % of T-helpers who take part in the induction of a specific immune response. II increased due to a decreasing of cytotoxic lymphocytes. The level of NK increased, which are able to lyse target cells infected with viruses and other intracellular agents.	The total number of white blood cells are normal. Absolute lymphocytosis. The relative number of B-lymphocytes is normal. The relative and absolute content of T-cell subpopulations is within the normal range, however, the ratio of CD4-T-helper and CD8 T-cytotoxic is reduced. The relative number of NK cells are normal.	

The aforementioned immunograms demonstrate the conditions of the immune system in dynamics. For example, there was not immune reaction on the immunogram in the beginning of therapy. On a repeated immunogram after 2 months, in the end of the 1st course of combination therapy (fluoroquinolones + recombinant human interleukin-2), we can see positive shifts in the immune response, that is, taking of the

immunomodulator, the immune system rebooted and began to activate as it should in the presence of an infectious agent and shows the height of the immune response to infection. The patient also underwent instrumental study (Table №3) before and after the first therapy, where positive dynamics were observed amid treatment, despite the inadequate immune response during treatment with immunosuppressant.

Table №3

Results of instrumental studies

method of study	Before treatment (15.02.2021r)	After the first course of treatment (22.05.2021)
MRI	MRI of the LSS revealed circular protrusion of discs between L4-L5, L5-S1, as well as aseptic spondylitis of L5-S1 bodies, arthrosis of ileosacral joints. MRI of ileosacral articulation in STIR mode: no data for acute sacroiliitis were found.	MRI LSS – osteochondrosis, moderate degenerative-dystrophic changes of LSS. Protrusion of L4-L5, L5-S1. The MRI picture may correspond to the complications of spondylitis at the L5-S1 level.
Joint ultrasound	Ultrasound of the right elbow joint: signs of chronic bursitis of the olecranon bursa. A small amount of fluid in the humeroulnaris and humeroradialis joints up to 2 ml. Uneven thinning of hyaline cartilage. Osteophytes. Ligamentopathy of medial and collateral ligaments.	Ultrasound of the elbow joints: pathological fluid was not detected. Uneven thinning of hyaline cartilage. Osteophytes.

Notable changes on MRI of the LSS. On the cross-section MRI image of the spine, there are similar signs of Brodie's abscess (sluggish primary chronic intraosseous abscess) in the bodies of the L5-S1 vertebrae, which is regarded as one of the special types of spine osteomyelitis, characteristic, including brucellosis spondylitis (Fig. 1).

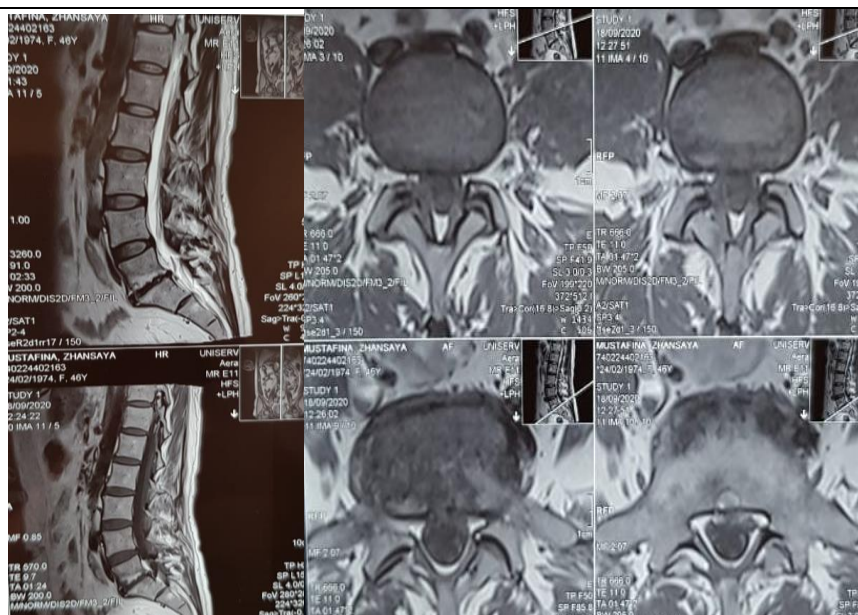


Fig. 1. MRI of the lumbosacral spine before therapy.



Fig.2. MRI of the lumbosacral spine after therapy

Ultrasound examination of the elbow joints also showed positive dynamics: relief of signs of bursitis and inflammation of the ligaments. The patient underwent X-ray densitometry, where osteopenia was found due to vitamin D deficiency and to patient was prescribed vitamin D at a dose of 3000 units per day.

Based on clinical manifestations (prolonged wave-like subfebrile fever), intoxication (chills, pain in bones and muscles, headaches, decreased appetite), astheno-vegetative syndrome (weight loss, weakness, anxiety, panic attacks), neuromuscular and articular syndromes (polyarthralgia) and symptoms of damage to the autonomic nervous system (instability Blood pressure, palpitations)), laboratory studies (lymphocytosis, positive result of Wright and Huddleson agglutination tests, antigen-binding lymphocytes of brucello-

sis specificity; ELISA for brucellosis with the negativity of the antibody to HLA B27 and the entire spectrum of rheumatological markers), instrumental studies (ultrasound signs of chronic bursitis of the olecranon bursa. Ligamentopathy of medial and collateral ligaments; MRI – picture of osteochondrosis of ThS. Circular protrusion of discs between L4-L5, L5-S1, aseptic spondylitis of vertebra body in L5-S1, osteoarthritis of the ileosacral joints), the presence of risk factors in the epidemiological history (reinfection) is diagnosed: Primary chronic brucellosis, decompensation stage, endogenous reinfection, with focal manifestations: spondyloarthrosis with neuromuscular syndrome, aseptic osteomyelitis of the L5-S1, bursitis of the right elbow joint, ligamentopathy, astheno-vegetative syndrome (sweating, hyperhidrosis of the palms, weakness, anxiety), constitutional manifestations:

wave-like fever, weight loss in debute, gynecological manifestations: miscarriage, dysmenorrhea. Osteopenia. Increased risk of fractures.

Treatment. According to the latest clinical protocol dated 03/29/2021 y., there are standard and alternative etiotropic therapy regimens for various forms of brucellosis. The patient needed several courses of treatment. **The first course of treatment (February-March 2021 y.):** antibacterial therapy: levofloxacin 1000 mg / day for 45 days; immunomodulator: a dosage form of recombinant interleukin-2 people – Roncoleukin 500,000 units 1 ml subcutaneously 1 time every 3 days (72 hour interval), a course of 5 injections under the control of CBC after each injection, **despite the therapy, patient complained to the persistence of pains in the cervical and thoracic spine more in the evening and at rest, tinnitus, instability of blood pressure.** The patient's mood and sleep improved. Due to the incomplete effectiveness of the 1st course of treatment under the control

of immunogram, to the patient was recommended the 2nd course of treatment: norfloxacin 500 mg, 1 tablet 2 times a day for 42 days, and Roncoleukin 500,000 units 1 ml subcutaneously 1 time every 3 days (interval 72 hours) 10 course of administration under the control of CBC per 1 time a week. At the moment, the patient is receiving the 2nd course of treatment, which she tolerates well.

Discussions: This clinical case clearly shows the difficulties of differential diagnosis of early SpA and chronic forms of brucellosis, especially when the patient has primary chronic brucellosis, when there is no acute period of infection with vivid symptoms of intoxication, fever syndrome and clinical manifestations are erased, imitating various other diseases accompanied by articular, neuromuscular, astheno-vegetative syndromes with wave-like fever. Table №4 shows the data on which manifestations this patient had in favor of the SpA diagnosis and which in favor of chronic brucellosis.

Table №4

Comparative table of clinical, laboratory and instrumental features of the patient based on diagnostic criteria of SpA and standard case diagnosis in chronic brucellosis.

Signs of chronic brucellosis according to the standard case diagnosis	Patient Information	ASAS criteria (2009 y.)
Subfebrile undulant fever	+	Not typical
Sweating (night sweats, hyperhidrosis of the extremities)	+	Not typical
Autonomic neuropathy (blood pressure instability, palpitations)	+	Not typical
Intoxication syndrome	+	Not typical
Asthenovegetative syndrome (weight loss, asthenia, feeling of anxiety, feeling of unease, panic attacks)	+	Sometimes losing weight may be
Generalized lymphadenopathy	+	Not typical
Polyarthralgia, polymyalgia, osteodynia	+	-
Articular syndrome		
Back pain	The pain can be both inflammatory and mechanical	Inflammatory back pain
Sometimes	Morning stiffness up to 30 minutes in the debut	Morning stiffness with a duration of more than 40 minutes
Radicular syndrome	+	Not typical
Bursitis	+	Not typical
Lesion of the ligamentous apparatus (ligamentopathy)	+	Enthesitis, commonly in the peripheral form of SpA
Lesion of the sternocostal articulation	+	Not typical
Unilateral sacroiliitis, sometimes bilateral sacroiliitis is possible, which disappears after treatment	Was not detected in the patient	Bilateral sacroiliitis
There may be spondylosis, spondyloarthritis, spondylodiscitis, osteochondrosis	Spondylitis, osteochondrosis with multiple protrusions	Spondylitis
Vertebral osteomyelitis	Brodie's abscess	Not typical

Laboratory diagnostics		
Possible positivity by HLA-B27	It was not detected during repeated laboratory testing by different methods	Positivity by HLA-B27
Possible. There is no clear correlation with the activity of the disease with laboratory indicators	Was not detected in the patient	High CRP levels
The positivity of serological analyses, ELISA and ABL of brucellosis specificity to varying degrees	+	Not typical
The epidemiological history of the patient is of great importance	the patient lived in the village when she was a child, where she consumed homemade milk and cattle meat	Not important
Treatment		
Temporary positive effect of taking NSAIDs	The short-term and incomplete effect.	The positive effect from NSAID
A good positive effect on taking fluoroquinolone antibiotics	A positive effect was observed in combination with recombinant interleukin-2 people	Not typical

This patient, as a result of chronic brucellosis, developed a degenerative spinal disease due to a decrease in bone density with limited mobility and severe pain syndrome, which led to temporary disability.

Conclusion. From this clinical case, it is necessary to draw the correct conclusion that it is necessary to increase awareness of chronic brucellosis among doctors, to whom patients usually come with various complaints, most often they are general practitioners, rheumatologists, neuropathologists and others, depending on the predominance of focal symptoms. Otherwise, in patients with late diagnosis, untimely and incomplete treatment, the disease may go into the stage of decompensation with the preservation of residual complications for life.

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BIOCHEMICAL BASIS OF CANCER IMMUNOTHERAPY. RECEPTORS AND SIGNALLING PATHWAYS TARGETED BY IMMUNOTHERAPEUTIC PREPARATIONS**Lupu A.,***student, Faculty of General Medicine, State University of Medicine and Pharmacy "Nicolae Testemitanu" Chisinau, Republic of Moldova***Simionica Eugeniu***PhD, university lector, State University of Medicine and Pharmacy "Nicolae Testemitanu" Chisinau, Republic of Moldova*[DOI: 10.5281/zenodo.7747232](https://doi.org/10.5281/zenodo.7747232)**Abstract**

Tumor cells can inhibit immune responses against their survival by activating inhibitory immune checkpoint proteins, which are PD-1 (programmed death receptor) CTLA-4 (cytotoxic T-lymphocyte antigen). PD-1 is the membrane receptor responsible for signal transduction into intracellular compartments and has two ligands PD-L1 and PD-L2. The effect of PD-1/PD-L1 complex is to inhibit the function and proliferation of T cells, resulting in the activation of T cell apoptosis. CTLA-4 has the structure of a type 1 transmembrane glycoprotein and has two ligands, CD80 and CD86, which are found on T regulatory and antigen-presenting cells. Endocytosis of the CTLA-4/CD80 complex results in the T-lymphocyte remaining in a state of low co-stimulation with maintenance of a suppressed counter tumor response. The main immunotherapeutic agents are monoclonal antibodies targeting CTLA-4, PD-1 receptors and PD-L1 and PD-L2 ligands.

Keywords: cancer, immunotherapy, PD-1, PD-L1, CTLA-4, structure, signalling pathways, monoclonal antibodies.

Cancer is defined as a rapid growth of abnormal cells in any part of the human body that can invade adjacent tissues and spread to other organs via the lymphatic or blood pathway. After many years of research into the biochemistry, clinical aspects and treatment of cancer, scientists have focused on the hardest aspect of fighting cancer - immunity. Tumor cells can suppress immune responses directed against their survival by activating immune checkpoint inhibitory proteins, which are PD-1 and CTLA-4. Blocking these proteins makes it impossible to suppress anti-tumor immunity and thus restores normal T-lymphocyte function. The signaling pathways of these receptors contain key structures that can be targeted by immunotherapeutic preparations. These structures are present as the interaction between the receptors and their ligands. CTLA-4 is the first receptor to be discovered, the ligands of which are CD80 and CD86 receptors. Another complex is represented by PD-1 and two ligands PD-L1 and PD-L2. The complexes listed are the targets of current immunotherapeutic treatment. [1][2]

PD-1, which is considered the most commonly used receptor in the fight against cancer. It is a transmembrane glycoprotein and contains 288 amino acids. The domain of this receptor, which is located on the

surface of the T-cell, is the primary domain, whose role is to interact with PD-L1 on the surface of the antigen-presenting cell. The intracytoplasmic domain contains two tyrosine-based signalling sites: a tyrosine-based inhibitory site (ITIM) and a tyrosine immunoreceptor switch site (ITSM). The PD-1/PD-L1 pathway itself comprises several signalling steps which for the T cell can be 'positive' and 'negative'. The first 'trigger' signal is the interaction of the major histocompatibility complex (MHC) with the TCR. The second trigger signal is presented by the formation of the CD80/CD28 complex. The third signal is the inhibitory one and comprises in itself two simultaneous interactions: PD-1/PD-L1 and CD80/CTLA-4. The T cell with the help of these signals regulates its activity and depending on the prevalence of one or the other type of signal can be subsequently activated or, conversely, inhibited and destroyed. The PD-1/PD-L1 complex produces a very strong counteraction to the MHC/TCR signal, i.e. the 'positive' signal. At the same time, this complex stops ZAP70 phosphorylation, inhibits PI3K and PTEN activity. As a result, the glycolysis process switches to beta-oxidation due to inhibition of the PI3K-AKT and ZAP70-ERK pathways and, as a result, the T cell is destroyed by apoptosis. [3][4][5]

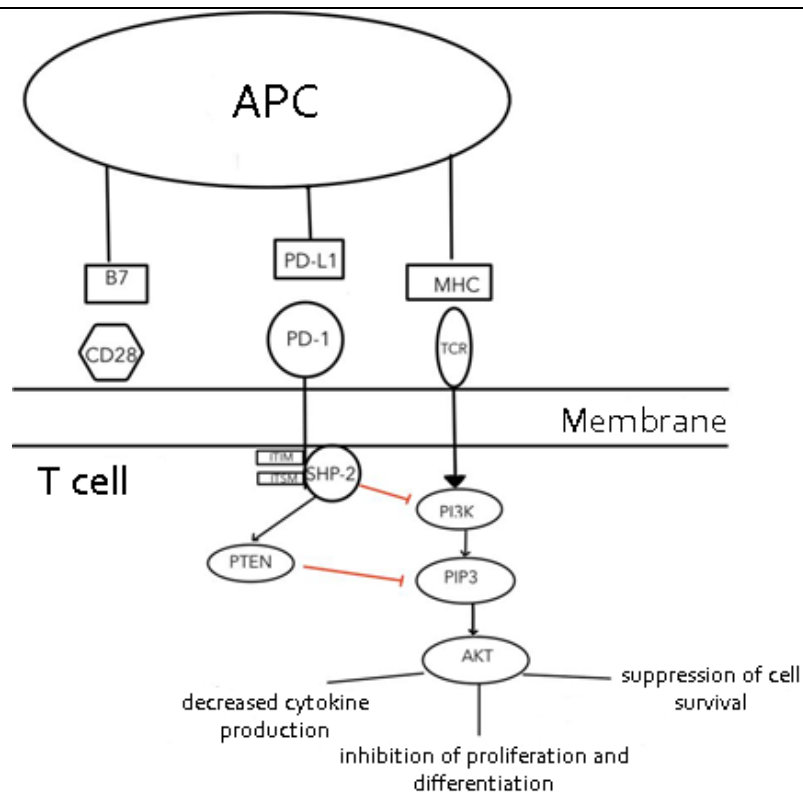


Figure 1. Activation effects of PD-L1

CTLA-4 likewise has the structure of a transmembrane glycoprotein and consists of 233 amino acids. This immune checkpoint consists of 4 domains: the leader, the binding domain, the transmembrane region and the cytoplasmic tail. The intracytoplasmic tail of CTLA-4 exhibits two phosphorylation motifs by the enzymes FYN (proto-oncogene tyrosine kinase), LYN (tyrosine protein kinase) and LCK (lymphocyte-specific protein tyrosine kinase). In addition, the tyrosine at position 201 of CTLA-4 interacts with LRBA, which prevents its early lysosomal degradation. Signalling of the CTLA-4/CD80 pathway starts primarily from the expression of CTLA-4 on the T cell surface. This process is influenced by a multitude of factors at the membrane, cytoplasmic and nuclear or genetic level. At the nuclear level NFAT, Foxp3, STAT1, Fos, MYC and Bcl-2 bind to the CTLA-4 gene promoter. At the cytoplasmic level AP-1 and AP-2 bind to the GVVVKM and YVKM gene sections for the purpose of maintaining stable levels of CTLA-4. MicroRNAs miR-155, miR-224-5p, miR-324-5p, miR-488-5p, miR-302a are involved in CTLA-4 gene transcription and its performance at the endoplasmic reticulum and Golgi apparatus. After release at the T cell surface CTLA-4 interferes with TCR and forms a complex of CTLA-4, TRIM, LAX and Rab8. After interaction with ligands or in the absence of the need for representation on the cell surface, CTLA-4 is destroyed at the endocytosomal level. This process begins primarily with the loss of LRBA protein at the cytoplasmic tail. Subsequently,

endosome formation requires the involvement of clathrin, dynamin and AP 2 protein, which binds to the CTLA-4 tail in place of LRBA. After internalization CTLA-4 can be lysosomally distributed or re-incorporated on the membrane surface of the T cell. The functional effect of CTLA-4 interaction on T reg lymphocyte is that CD80 on the CPA surface has much higher affinity for CTLA-4 on the T reg surface than for CD28 on the conventional T lymphocyte. The tumour micro-environment differs from the usual immune cell environment by the abundant amount of regulatory T cells, which in turn cause the attachment of CD80 or CD86 receptors only to CTLA-4 receptors and the result of this difference is low co-stimulation of conventional T cells with preservation of the inhibited anticancer response. If it is possible to block CTLA-4 by antibodies, CD80 or CD86 have only one attachment site - CD28 (fig 2). This blockade can be performed by different methods, as for example direct receptor blockade on T reg or on the constant fragment (Fc) that is attached to the macrophage. The result is one - depletion of Treg, formation of CD80 or CD86 complex with CD27, increased co-stimulation of conventional T cells and adequate immune response. Subsequent internalization of the CTLA-4/CD80 complex leads to decreased co-stimulation of conventional T cells with subsequent formation of the ineffective immune response.[7][6][9][12]

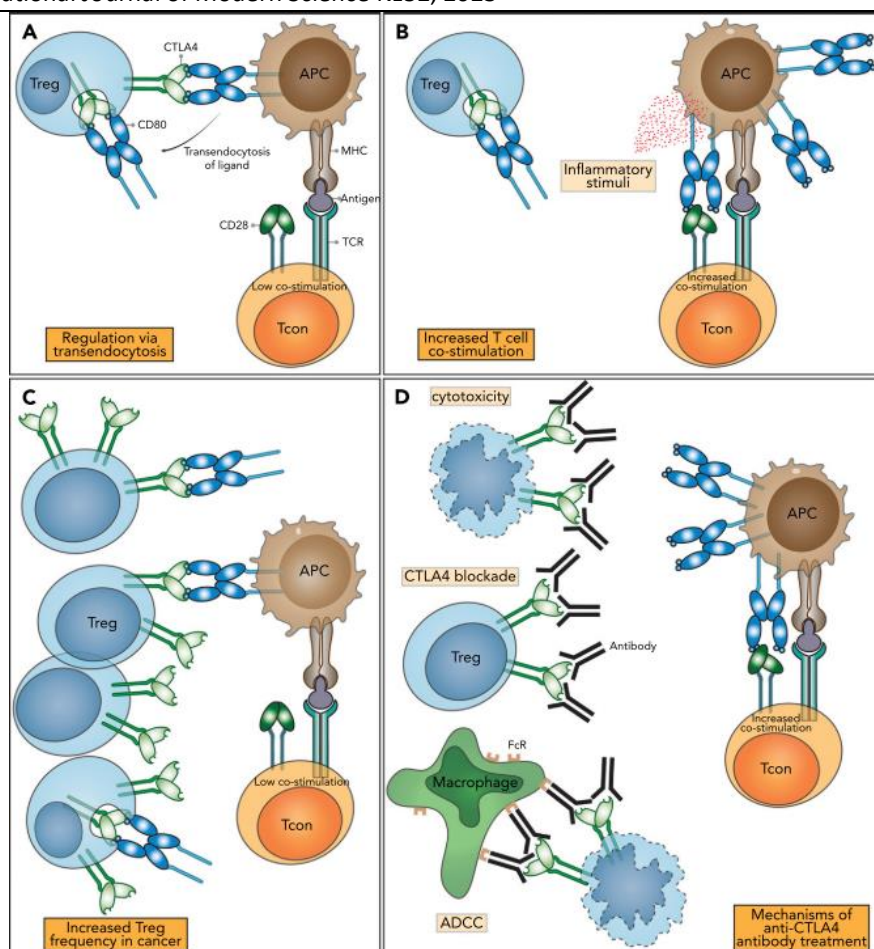


Figure 2. CTLA-4 functions [9]

So, at present FDA has approved 3 immunotherapeutic preparations, which are anti-PD-L1 monoclonal antibodies, and these are Atezolizumab, Durvalumab and Avelumab. These preparations are IgG class PD-L1 blockers, which are formed from Fab and Fc, where on the VL surface of Fab there are 6 loops: HCDR1, HCDR2, HCDR3, LCDR3, LCDR1, LCDR2. The structural difference of these preparations is that different IgG loops are involved in the binding process with the immune checkpoint receptor. The affinity of certain loops towards the receptor or ligand does not lead to irreversible transformation of the structure, but only blocks the binding site. In 2022 and 2023 the FDA approved two new preparations, nivolumab and pembrolizumab, which are monoclonal Ac of PD-1. The blockers of this receptor are of the IgG4 class in which the constant region is identical, but the variable region in pembrolizumab involves the C'D and C,C' loops and nivolumab only the C'D site. The monoclonal antibody to CTLA-4 ipilimumab is not yet FDA approved and is in the investigational process. Ipilimumab is assigned to the n IgG class, in which its constant region has the ability to induce antibody-mediated cytotoxicity. [8][10][11]

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CLINICAL ASPECTS OF COMMUNITY-ACQUIRED PNEUMONIA IN THE ELDERLY**Mașcauțan Alina***Student, Faculty of General Medicine,
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Republic of Moldova, Chisinau*[DOI: 10.5281/zenodo.7747246](https://doi.org/10.5281/zenodo.7747246)**Abstract**

Community-acquired Pneumonia (CAP) is a widespread disease that mainly affects the elderly, resulting in more serious consequences than among the young population[3]. This increased incidence among the elderly of CAP is due to the fact that physiological changes occur to which the lower respiratory tract is subjected (reduction of mucociliary clearance and cough reflex), the immune system(immunosuppression),but also cormobidities (renal pathology, cardiac,chronic cerebrovascular disease, diabetes mellitus) that occur with the aging of the human body . Among the main causal factors leading to a serious development of CAP among the elderly are alcoholism, tobacco smoking, obesity, various degrees of disability, sedentary lifestyle, bipolar disorder [4].

Keywords: pneumonia, cormobidities, symptoms, elderly

Introducere

At present, the elderly population, older than 65 years, is constantly increasing, but their longevity is not always associated with a satisfactory state of health. A good part of people older than 65 years suffer from a lot concomitant pathologies (two or more chronic pathologies), which leads to an increase in mortalității.Pe as the human body ages, changes in the immune system occur, so that most of the elderly are more prone to surrounding infections [1]. Statistical data show that the CAP mortality rate among the elderly remains a dramatic one as it was 1000 years ago , thus reaching some conclusions that by 2050, when 20% of the global population will be elderly, the incidence of community pneumonia will be one of the leading causes of mortality [2].

Aim of the study

Due to the fact that CAP in elderly patients have an atypical clinical picture, diagnosis of pathology occurs late, with severe forms, so we set the goal-to identify the symptoms characteristic of elderly patients with CAP,which requires a specific approach and therapeutic conduct.

Materials and methods

The study included 50 patients diagnosed with community pneumonia, treated in the pulmonology department of IMSP SCM " Sf. Arhanghil Mihail " during the years 2017-2019. More common CAP was found in male gender 35(70%) compared to female gender 15 (30%). The database of the selected materialwas processed statically using the Microsoft Excel program.

Result and discutions

Following the analysis of the 50 elderly patients with CAP , a higher incidence of CAP was observed among patients aged 65-70 years -35(70%), and the lowest frequency occurring in those aged 76-85 years - 5(10%) (Figure 1).

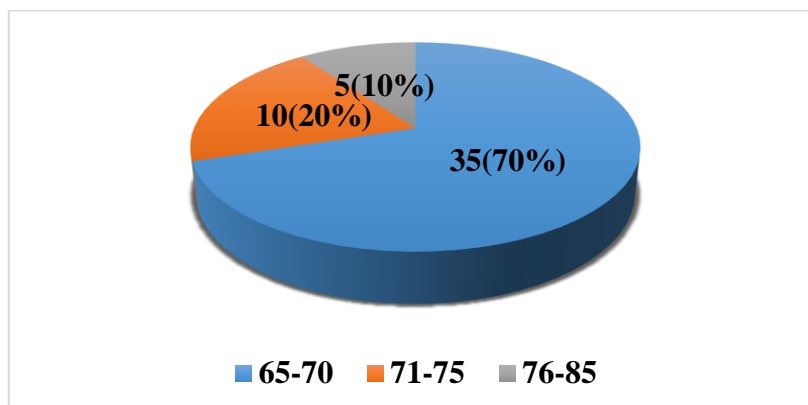


Figure 1. Age distribution of elderly patients with CAP

The examination of the anamnesis revealed the presence of comorbidities in elderly patients that may influence the evolution of CAP, or on the contrary may be aggravated following the development of the inflammatory process, which is of great importance in the evolution and prognosis of CAP in elderly patients. It was noted that cardiovascular pathology (Hypertension

-38(76%), chronic heart failure-23(46%), Angina pectoris-22(44%)), is most prevalent in elderly patients with CAP, in second place is located Diabetes Mellitus Type II and pathology of the respiratory system (chronic obstructive Bronchopneumopathy, bronchial asthma) -19 (38%). Table 1.

Table 1.

Cormobidities of elderly patients with CAP

Cormobidities	%
Hypertension	38(76%)
Chronic heart failure	23(46%)
Angina Pectoris	22(44%)
Diabetes Mellitus Type II	19(38%)
Pathologies of the respiratory system	19(38%)
Pathologies of the urinar system	18(36%)
Chronic pancreatitis	8(16%)
Chronic hepatitis	8(16%)
Encephalopathy	5(10%)

In order to highlight the onset of the disease in patients in both groups, the symptoms presented by patients at admission were evaluated.

Table 2.

Clinical manifestations of elderly patients with CAP

Charges	%	
Body temperature values	36,9 °C	14(28%)
	37°C-37,5°C	31(62%)
	37,6 °C-38,5 °C	5(10%)
Shiver	24(48%)	
Chest pain	28(56%)	
Dyspnea	50(100%)	
Headache	14(28%)	
Nausea	5(10%)	
Asthenia	46(92%)	
Sweating	40(80%)	
Altered mental state	8(16%)	
Cough	dry	42(84%)
	wet	8(16%)
General condition	Medium gravity	36(72%)
	Sever gravity	14(28%)
Tachypnea	50(100%)	
Tahycardia	50(100%)	
Peripheral oedema	18(36%)	
Fatigue	45(90%)	

Elderly patients with CAP showed an insidious, atypical onset with a predominance of fatigue, dyspnea, tachypnea, tachycardia, sweating, asthenia. La the majority of elderly patients had subfebrility and only 5 (10%) had fever, due to the presence of multiple cormo-

bidities that patients had (chronic pyelonephritis, urinary infections). Another complaint that elderly people with CAP presented was cough which at 42(84%) was a dry, excruciating one, due to the inability of patients to expectorate. Table 2.

Table3.

Physical examination data in elderly patients with CAP

Features	%	
Submatitia	46(92%)	
Murmur	tightened	39(78%)
	diminished	11(22%)
Small bullous rales	40(80%)	
Crepitations	27(54%)	
Dry rales	15(30%)	

In the physical examination of elderly patients with CAP, we found that in 46(92%) local submatitia, the predominance of the tightened murmur was also revealed 38(78%) compared to the dimunuated one 11(22%).In the auscultatory examination of the thoracic box in elderly patients , the small bullous Rales-40(80%), and the dry ones only at 15 (30%).

Concluzii

1.Clinical onset in most elderly patients is insidious, with a little expressed symptomatology, often with a predominance of general symptoms(general weakness, fatigue, signs of confusion), which contributes to a late establishment of the diagnosis.

2.The evolution of CAP in the elderly is influenced by the presence of cormobidities, which due to the infectious process can decompensate and influence the evolution and prognosis of CAP.

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THE ROLE OF TORCH INFECTION IN EARLY MISCARRIAGE. MORPHOLOGICAL STUDY**Teacă Irina,***Student, Faculty of General Medicine, State University of Medicine and Pharmacy
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'Nicolae Testemitanu' Republic of Moldova, Chişinău*[DOI: 10.5281/zenodo.7747251](https://doi.org/10.5281/zenodo.7747251)**Abstract**

Background: Early miscarriage is the spontaneous loss of intrauterine pregnancy before 12 weeks of gestation. Spontaneous abortion is a frequent complication of pregnancy that represents approximately 10% of pregnancy pathologies and 80% of all abortions. The most susceptible period in pregnancy for early abortion is in the first 10 weeks of gestation when organogenesis takes place. The study of the clinical-morphological peculiarities in spontaneous abortion causes changes in the chorio-villus profile and the gestational vascular remodelling with the development of primary placental insufficiency. TORCH infections are a major source of pregnancy disruption at early gestational age.

Conclusions: Placental components, particularly the syncytiotrophoblast (SYN), represent an important protective barrier in the transmission of transplacental infections. TORCH infection, during the gestation period, causes disturbances in the early development of the placenta with the involvement of the vascular component and the villous profile with a negative impact on the pregnancy resulting in miscarriage. The evaluation of the morphopathological profile during the early development period of the embryo-feto-placental complex will provide information regarding the characteristic changes induced by infections in the context of the abortive disease.

Keywords: Early miscarriage, chorionic villi, placenta, vascular component, TORCH infection.

Introduction

Early miscarriage is the spontaneous loss of intrauterine pregnancy before 12 weeks of gestation [15]. Although it is common [15], miscarriage is less studied, in approximately 50% of cases the aetiology is unknown, and in 50% it is multifactorial [30]. In humans, the placenta forms a protective barrier for the embryo that restricts the hematogenous spread of microorganisms [3]. In general, congenital infections associated with miscarriage, are a major cause of mortality and morbidity worldwide. In order to establish the diagnosis of early miscarriage, an important role is attributed to the morphological examination. Ultimately, the morphological examination of the placenta will identify pathological changes with disease in the villous tree and the remodelling of the spiral arteries induced by the infectious disturbances. The human placenta controls the infections by inducing a unique immunomodulatory response.

The SYN have a direct role in the protection of the embryo from infections. The continuous multinucleated cell layer of syncytiotrophoblast (SYN) is resistant and destroys hematogenous microorganisms by restricting parasite attachment, inhibiting invasion and active intracellular replication [3]. TORCH infection is a congenital group of microbial infection with vertical transmission. Infectious agents included in TORCH infection are *Toxoplasma gondii* (T), Others (O) such as *Listeria monocytogenes*, *Troponema pallidum*, Parvovirus, HIV, etc., Rubella (R), cytomegalovirus (C), and Herpesvirus (H) [5]. The morpho-pathological study will evaluate the morphological structure of the utero-placental complex complicated with early spontaneous abortion with an infectious substrate and will establish

the morpho-pathological criteria in primary placental insufficiency.

Histological profile in gravidar endometrium.

To ensure the implantation of semi-allogenic blastocyst, the endometrium will undergo a complex of functional and structural changes determined by progesterone, necessary for adaptations to the blastocyst during pregnancy. Progesterone is secreted by the corpus luteum and will maintain the secretory phase of the endometrial glands [20]. The endometrium will go through the cell differentiation phase with endometrial pre-decidualization [20], then complete decidualization specialized for blastocyst implantation with typical signs in the morphological picture. So, the high level of progesterone transforms the mucosa uterine into the decidua basalis. The hallmark of decidua gravidaris is secretory decidual glands and abundant vascularity [10]. Glands become hypersecretory, known as the Arias-Stella reaction [37]. The secretory glands are enlarged [27], spiral in appearance, and rich in glycogen, immunosuppressants, glycodepin A, and uteroferrin, necessary for the histiotrophic nutrition of the postimplantation trophoblast [10, 16].

The early period of placentation

In the fertilization process, in the fallopian tubes, daily the zygote goes through the segmentation stage, dividing into a blastomere, then a morula, and later a blastocyst that will migrate into the uterus and attach to the endometrial mucosa [32]. The decidua basalis has a critical role in the homeostatic balance between the mother and fetus. In the process of pregnancy, the decidua basalis includes genetic predisposition and immunological balance that ensures a strong immunological tolerance function for the protection, attachment

and invasion of the trophoblast perceived as a semi-allograft by the maternal immune system [24] and allows the attachment and implantation of the blastocyst [5]. The maternal-fetal interface has multiple immune cells vitals for the developing foetus [10]. Therefore, the decidua contains 40% immune cells, of which 70% are uterine natural killers (NKu), 25% - are macrophages and 3-5% T cells [5]. Natural killer cells are essential for embryo nutrition and vessel remodelling [10]. After attachment, the blastocyst separates into 2 layers: external-embryoblast and internal trophoblast [37]. With implantation, the trophoblast passes through the pre-lacunar stage with the division into 2 columns syncytiotrophoblast (SYN) and cytotrophoblast (CTB) [22]. Later, in the syncytiotrophoblast, appear trophoblastic lacunae filled with maternal blood that divide into trabeculae, characteristic changes for the lacunar stage [37]. The SYN also erodes into decidual glands and trophoblastus is completely embedded in the decidua and obtains the histiotrophic nutrition necessary for the development [22]. The cytotrophoblast, with synthesis from the primary chorionic plate, invades the lacunar trabeculae and forms the primary villi [21]. Extraembryonic mesenchyme penetrate through the primary villi core and starts the development of the secondary villi [21]. Later, around day 18, the cytotrophoblast invades the maternal tissues and the spiral arteries, thus establishing the fetoplacental circulation in which the embryo will obtain chemotrophic nutrition having direct access to the maternal blood [21]. Thus, on day 18-20 p.c, the first fetal capillaries are identified in the chorionic villi and the primary vascular network is formed, and the secondary villi with vascular proliferation processes become tertiary villi [21]. Next, is the arrangement of the villous tree in cotyledons and the expansion of the fetoplacental circulation throughout the villous mass [21]. Until the end of gestation, the uteroplacental complex is irrigated by 2 vascular systems. The open circulatory system with the origin of the spiral arteries (uteroplacental and intervillous) and the embryo-fetal vascular system of the closed type consists of 2 arteries and an umbilical vein [21].

The role of the syncytiotrophoblast in limiting infection

The first barrier to infectious agents in maternal blood is the syncytiotrophoblast. The syncytiotrophoblast represents a continuous multinucleated layer of cells involved in the protection of the product of conception against infection [15]. Accordingly, damage to SYN destroys the passage of the pathogen to the chorionic villus, because CTB is permissive to infection [18]. The SYN have a direct role in the protection of the embryo from infections. The syncytio has lytic action at the level of attachment, invasion and intracellular replication of microorganisms [15]. Because anchoring villi are not delimited by SYN and villous capillaries are in direct contact with maternal blood, terminal villi will be considered weakly permissive sites for microorganisms [18]. A morphological marker characteristic of the passage of the placental barrier with the microorganisms is the inflammatory response

perivascular and in the villi with accumulation of immunocompetent cells (macrophages, lymphocytes, plasma cell and granulocytes) [18].

Toxoplasma gondii

T. gondii is a protozoan parasite with strictly intracellular replication [13]. The infection is transmitted by the sick cat excreting the oocyst [11, 14]. These oocysts once passed out from cat through feces, can contaminate the soil, water or vegetables and fruits which are consumed by pregnant women without washing. It is known that 30% of the global population presents an asymptomatic form with chronic *T. gondii* infection, with exacerbation in an immunosuppressed state [19]. Vertical transmission of the parasite from mother to embryo occurs [35] in approximately 50% of cases. A major risk of spontaneous abortion is presented by women primarily infected during pregnancy [32] when antibodies to *T. gondii* are missing. At the morphological investigation stage, free tachyzoites and tissue pseudocysts can be identified in the toxoplasmosis placenta [35]. Pseudocysts causing reduced inflammation and can be visualized by HE and PAS staining. Endozoites condition active inflammation and are identified by Giemsa staining [35]. The immunological response in the presence of a recent infection is the hyperproduction of Ig M, followed by Ig G [31, 33]. Susceptible to infection are anchoring villi and CTB [32]. Inhibition of parasite replication at the placental level is achieved by macrophages activated by IFN- γ [29]. The characteristic histological features of the infection are the delayed maturation of the villi with an intense degree of proliferation of Hofbauer macrophages, a reduced degree of placental vs embryonic inflammation and lymphohistiocytic reaction [29]. Typical for placental toxoplasmosis is characteristic villitis with villous conglutination and numerous cysts around the umbilical vein [32]. At the same time, the vascular component is also affected by the formation of thrombi in the chorionic vessels and the calcification of the arterial walls [32]. Under the globally aggravating statistics and the severity of the pathology, routine investigation of women planning a pregnancy is recommended. At the same time, in the prevention of this infection, it is necessary to take into account the way how the meat is prepared, avoiding the consumption of partially prepared meat. Pregnant women should refrain from contact with street cats, and if they live in the same house with their cat, it will be recommended to take care of it with gloves. Cat faeces will be collected at least 24 h after defecation [31].

Syphilis (Troponema pallidum)

Approximately 2 million pregnant women have been diagnosed with syphilis annually [25]. *Troponema pallidum* is a gram-negative spirochete that represents the infectious agent in syphilitic infection [7]. Transplacental infection can cause congenital infection with varied degree of clinical manifestations [31, 32]. The symptoms of *T. pallidum* infection in pregnant women appear in three stages. Initially, are affected the lymphatic systeme (lymphadenitis) and the skin with lesions on the skin where the bacteria entered the body called a chancre. Secondary syphilis appears a few weeks after the chancre has healed, and the pregnant

woman complains of irritation and rashes on the hands and feet. Symptoms persist for several weeks and disappear forever or may recur in a situation of immunosuppression. 15-30% of pregnant women may present symptoms with neurological, cardiovascular and osteo-articular damage, characteristic for tertiary stage of syphilis [31]. Congenital syphilis is transmitted from the fetus in the first and second stages [25]. The macroscopic examination reveals a voluminous and pale placenta, specific for fetal anaemia [32]. At the villous level, is determined the microscopic triad: increased villi, stromal hypercellularity and villous immaturity vs gestational age [25]. Occasionally, can be determined acute lymphohistiocytic villitis or peritonitis occurs with a predominance of CD3 lymphocytes and plasma cells, and the immunohistochemical test identifies few inclusions with spirochetes [6, 34]. Sensitive to pathological changes are the growth buds of the villous tree, where is determined hyperplasia of stromal cells, with pronounced edema of fetal capillaries and endo- vs perivascular fibrous tissue deposition with the development of venous and arterial vascular insufficiency, resulting in fetal malperfusion followed by embryonic death [32].

Parvovirus B19

It is a DNA virus [31] that occurs with a frequency of 1-400 pregnancies, in most cases manifesting itself asymptotically [15, 32]. Statistically, the risk for early spontaneous abortion is registered starting from weeks 4-6 of gestation [32, 26]. For routine diagnosis of "erythema infectiosum," it is used immunohistochemical examination which confirms the presence of NCL-PARVO antibodies [15]. The hallmark of infection with parvovirus B19 is hyperchromatosis of nuclei in giant cells with granulocyte necrosis [32]. Sometimes vascular damage can be observed with the presence of lymphocytic inflammation in the endothelium of the umbilical artery [32]. Many times, can be determined trophoblast apoptosis and calcifications in the stroma of the villi with marginal oedema [32]. In the fetus, it causes severe anaemia and pronounced hydrops with the presence of erythroid inclusions that require PCR confirmation [28].

RUBELLA

Global vaccination has greatly reduced the incidence of rubella infection during pregnancy [32]. Infection with the rubella virus, during early gestation, causes pathological changes at the level of the fetoplacental complex with evolution in spontaneous abortion [23]. A wide area of villi is usually affected with necrosis, fibrosis and stromal sclerosis and obliteration of spiral artery branches [23, 32]. Fetal malperfusion is the result of the activation of both villous and perivascular inflammatory mechanisms with the involvement of Hofnauer macrophages and intervillous and perivascular eosinophilic inclusions [32].

To prevent rubella infection, the MMR (measles, rubella, mumps) vaccination is recommended for women one month before conception [21, 32].

Cytomegalovirus (CMV)

Infection (CMV) affects 1% of pregnant women [32] and is transmitted to the fetus in approximately

40% of cases [32]. CMV is a member of the virus family, *Betaherpesviridae*, with a DNA genome [31]. It has been shown that infection in early gestation is much more severe than infection in late gestation [32].

Microscopically, through the PCR reaction, viral inclusions are identified at the decidua level, villous cytotrophoblast, anchoring villi and extravillous trophoblast [36]. Often spontaneous abortion occurs following the development of hydrops in the embryo [32] and is correlated with the severity of the infection. In the villous we can see tissue necrosis and inflammatory process that cause lymphohistiocytic villitis with eosinophilic and viral inclusion, lymphocytic infiltrates in the nucleus and cytoplasm and large Hofbauer cells [36]. Consistent with this, in the embryonic vascular system, we identify avascular regions with pronounced vascular involution and severe hypoxia [38]. Often the endo- and perivascular edema of the chorionic vessels causes vascular obstructions due to thrombosis and calcifications. A distinct sign of Cytomegalic aggression is the finding of "owl eyes" in the Chorio-villous compartment [32].

Herpes simplex virus (HSV)

It belongs to the *herpesviridae* family and has two forms HSV 1 and HSV 2 [30]. Infection HSV is considered one of the most aggressive viral infections resulting in spontaneous abortion if the pregnant women are infected in the early term of gestation [31]. It is transmitted vertically through the entry mediators HveA, HveB, and HveC present in the cytotrophoblast [18]. HSV pathogens utilise the fetomaternal interface as a replication surface before diffusion to the placenta and fetal compartment. Viral invasion causes non-specific HSV histopathological manifestations, therefore often any inflammatory response at the level of the fetoplacental complex requires the performance of diagnostic tests for HSV [9]. Herpetic placentitis is characterized by an acute lymphocytic villitis in early diagnosis and chronic plasmacytic villitis with Cowdry A and Cowdry B inclusions in the extravillous trophoblast (EVT) and less in the villous trophoblast [18] in chronic infection. Also, HSV infection determine the villous necrosis and the immaturity of the villi which are often sclerosed with chronic intervillous manifested by abnormal deposits of fibrinoid in the intervillous space [9]. In severe forms, the vascular profile is affected by the deposit of fibrin, fetal lymphocytes and endovascular eosinophils with the development of the villous hypo/avascular network or the formation of vascular thrombi following inflammatory mechanisms [9, 12].

Conclusion

In this narrative review of specialized literature, we aimed to highlight the importance of the histological examination in elucidating the pathogenesis of spontaneous abortion. The identification of placental lesions specific to TORCH infection presents both common changes (villitis, intervillous, damage to the vascular component) but also distinct changes such as the inclusions specific to each pathogen that will guide the diagnosis and subsequent management. Also, some infections such as HSV and CMV are initially asymptomatic and only early morphological diagnosis will provide

the opportunity to intervene immediately until irreversible complications develop in the intrauterine development of the embryo.

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ANALYSIS OF ADULT TYPE 2 DIABETES MELLITUS PATIENTS' SALIVARY PROFILES IN BABYLON PROVINCE

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Abstract

Background: There has not been much agreement on the hypothesis that diabetes is associated with salivary dysfunction, thus we looked at salivary parameters in diabetic and non-diabetic people. Diabetes mellitus may be diagnosed and monitored more effectively if saliva is used instead of blood. **Materials and Methods:** At least two years before the start of the trial, all participants had been diagnosed with Type 2 Diabetes mellitus in one form or another and were on antidiabetic therapy. All of the saliva was collected in a fasting state without any stimulus. Measurements of saliva's organic and inorganic content, pH, flow rate, and other parameters were made. These findings were then put under statistical scrutiny. **Results:** Salivary pH, flow rate and salivary amylase were significantly lower in diabetics who were on antidiabetic therapy. They had significantly higher levels of salivary glucose, total proteins, sodium and potassium and lower levels of calcium in comparison to those in the non-diabetic group. **Conclusion:** Diabetics and non-diabetics differed significantly in the physical and biochemical properties of their saliva. It is possible to screen, diagnose, and monitor for diabetes using salivary characteristics, which are less intrusive than blood tests.

Keywords: Adult Type 2 Diabetes Mellitus ; Salivary Profiles ; blood tests; Babylon Province

Introduction

Although Type 2 Diabetes Mellitus (T2DM) may be treated, long-term complications remain the biggest health dangers. Worldwide and in Babylon city, epidemiological research reveal that the burden of T2DM is increasing significantly. Per J E Shaw et al., diabetes will affect 7.7 percent of individuals (20–79 years old) by 2030 [1]. There are no exceptions to this pattern in our country. With increasing rates of obesity, type 2 diabetes (T2DM) and cardiovascular disease (CVD) mortality and morbidity in the United States are on the rise[2,3], There are several organ systems that are affected by diabetes mellitus (DM). It is possible for people with diabetes mellitus type 2 (T2DM) to develop neuropathy and other neuropathy-related conditions due to long-term high blood sugar levels[4].

Furthermore, salivary glands seem to be affected. Xerostomia, periodontitis, gingivitis, odontogenic abscesses, and soft tissue lesions of the tongue and oral mucosa are among the documented oral health concerns associated with T2DM that practitioners often observe[5]. As a result of poorly controlled Type 2 Diabetes, salivary function suffers. Autonomic neuropathies, microvascular alterations, hormonal abnormalities, or a combination of these might cause

diabetics to have salivary hypofunction and dehydration[6].

T2DM and salivary dysfunction in diabetes have yet to be established as a plausible link between the two conditions. This research was designed to test the hypothesis that physical and biochemical properties of saliva differ between diabetes and nondiabetic patients. Flow rates, morphological properties, and biochemical profiles of participants' saliva were studied, as was the association between fasting plasma glucose levels and salivary parameters, in this study, which included participants with and without diabetes.

Materials and Methods

This research included 30 diabetics and 30 non-diabetics. People were chosen at random from a pool of prospective volunteers (Table 1). Diabetes had been diagnosed at least two years before to participating in this study, and all participants were undergoing antidiabetic therapy at a private hospital. Participants ranged in age from 40 to 55. As early as the first year after diagnosis, it has been shown that DM difficulties begin to develop. T2DM had been present in the lives of the participants for at least two years. In order to exclude participants with depression, edentulism, or systemic illness, the researchers eliminated individuals with radiation to the head and neck[7-9].

Table 1.

Participants age group			
Patients age group	No.	Healthy age group	No.
40-45	14	40-45	12
45-50	7	45-50	10
50-55	9	50-55	8
Total	30	Total	30

People who were not diabetic but had gone to the emergency department or lab for another test made up the control group. This study required all participants to complete a written informed consent form before they were allowed to participate in it.

At 7 to 8 a.m. in the morning, while they were fasting, researchers administered demographic and medical questionnaires to the participants, after which samples of saliva were taken from them. For five minutes, we

collected unstimulated entire saliva using a standardized spitting method. To ensure that there was no selection bias, all of the individuals' saliva was collected by a single observer. Glass electrodes from Systronics' pH system were used to test the salivary pH in less than an hour after the samples had been collected from the subjects.

Calculated salivary flow rates were represented as millilitres per minute (ml/min).

At 5000 rpm, the samples were centrifuged, and the supernatant was collected and kept at -8C until further analysis was possible. There was also a look at the biochemical features of the saliva. Inorganic elements such as sodium and calcium were present together with organic substances such as glucose and total protein (analysed by using a semi auto analyzer). SPSS version 15 was used to do the statistical evaluation. A Student's t-test was used to compare the salivary parameters between diabetics and those without diabetes.

Results and Discussion

We recruited a total of sixty participants, 30 of whom had diabetes and were on antidiabetic therapy and 30 of whom had normal blood sugar levels. Participant average was 48.7 years. It was reported that there

were 30 diabetics in all, with a median age of 49.11 years for the 12 men and 18 females. Average age for the non-diabetic individuals was 44.44 years; 14 men and 16 women were in excellent health at that age. A comparison of pH, salivary flow rates, and biochemical markers in the male and female groups revealed no differences.

In Table 2, we display the mean standard deviation for salivary pH and entire salivary flow rate at rest in non-diabetics and diabetics. In diabetics, salivary pH levels were much lower than in individuals without diabetes. (Non Diabetics (ND) $=8.11 \pm 0.17$, Diabetics (D) $=5.83 \pm 0.05$, $p=0.000$). The flow rate in diabetics was considerably reduced with values of 0.38 ± 0.22 and in ND it was 0.61 ± 0.17 which was statistically significant ($p=0.002$). Non-diabetics and diabetics differed significantly in their biochemical profiles [Table3]. Diabetics had higher amounts of salivary glucose, total protein, sodium, and potassium, as well as lower levels of calcium ($p= 0.0001$). Among diabetics, there was a statistically significant drop in salivary amylase concentrations ($p= 0.0001$).

Table 2.

The mean standard deviation for salivary pH and entire salivary flow rate at rest in non-diabetics and diabetics

"Parameter Studied"	Non Diabetic Subjects (MEAN \pm SD)	Diabetic Subjects (MEAN \pm SD)	p value
Salivary pH	8.11 ± 0.17	$5.83 \pm 0.05^*$	$p=0.000$
Salivary flow rate(ml/min)	0.61 ± 0.17	$0.38 \pm 0.22^*$	$p=0.002$

Table 3.

Biochemical profiles of the saliva in non-diabetics and diabetics

Parameter Studied	Non-Diabetic Subjects (Mean \pm Sd)	Diabetic Subjects (Mean \pm SD)	p Value
Glucose (mg/dl)	3.27 ± 0.17	$19.55 \pm 1.55^*$	$p=0.001$
Salivary alpha amylase	103.51 ± 08.55	$15.88 \pm 1.6^*$	$p=0.0001$
Total proteins(g/l)	466.38 ± 186.33	$856.19 \pm 403.67^*$	$p=0.001$
Sodium(mEq/l)	3.89 ± 0.36	$16.52 \pm 0.98^*$	$p=0.001$
Potassium(mEq/l)	22.12 ± 0.67	$28.77 \pm 0.22^*$	$p=0.001$
Calcium(mEq/l)	7.08 ± 0.22	$3.66 \pm 0.08^*$	$p=0.0001$

Drugs such as anticholinergic and diuretics, anti-histamines, anti-hypertensives, etc., may modify salivary parameters in people with metabolic and neurological problems as well as those who are dehydrated [10]. Salivary secretions may be altered by diabetes-related microvascular issues and, as a result, autonomic neuropathy [11]. Although several research have been undertaken to examine the effects of T2DM on salivary functioning, the results are still ambiguous. Because of this, we decided to conduct our research on a diabetic population from Babylon City in order to see whether the physical and biochemical properties of saliva in diabetics differ from those of non-diabetic controls. The idea was to suggest that saliva may replace blood in the diagnosis and monitoring of diabetics.

Resting salivary pH in healthy people was estimated in many investigations to be between 5.5 and 7.9 [12]. The pH of saliva is maintained by buffers such as carbonic acid and bicarbonate systems, phosphate

systems, and protein systems [13]. Patients with diabetes have pH values that are lower than those of healthy individuals. Diabetic participants exhibited an acidic pH as well, which M E Lopez *et al.*, found to be caused by the presence of bacteria or by the drop in bicarbonate levels that occurred with the increase in flow rate [14]. However, there is a lack of research on salivary pH alterations in T2DM.

In the absence of external stimulation, the mouth produces a combination of secretions known as resting saliva. For those who suffer from dry mouth and hyposalivation, the flow rate is substantially below the normal 0.3-0.5 ml/min resting rate for entire saliva. Citric acid is known to cause an increase in saliva flow rate between 1.0 and 3.0 ml/min. In diabetics, the salivary flow rate is much lower than in the general population. Those with diabetes have been shown to have a decreased salivary flow rate than those without diabetes.

Due to an increased diuresis caused by inadequate glycaemic control, diabetics have increased thirst and dry mouth. People with and without type II diabetes who were studied by Cherry–Peppers et al. for flow rate came to the same conclusion[15-17].

Those with Type 1 diabetes were shown to have lower salivary flow rates than those with normal glycaemic control and those who were not diabetic. When blood glucose levels are under control, it seems that normal salivary flow rates may be restored[10,18]. Moreover Sugary saliva production, which is controlled by the autonomic nerve system, may be a symptom of diabetes autonomic neuropathy in diabetic individuals. Studies by Meurman and Tenouvo found no difference in salivary secretion rates between T2DM patients and healthy controls[19,20].

The levels of glucose in the saliva of diabetics were found to be much greater than those of healthy people. One possible explanation for this is that glucose homeostasis has changed. Blood glucose filters, according to Chatterton RT and colleagues[21], may be influenced by hormonal or neurological regulation of the salivary glands[22]. Another study found that diabetics have higher salivary glucose levels than non-diabetics. It was shown that diabetics' salivary glucose levels had a negative correlation with their glycaemic status, as well as their HbA1c levels, in another study by Lopez *et al.*, [12,13]. Karjalainen *et al.*, [16] found that once insulin therapy was began, diabetics' salivary glucose levels dropped. There was no difference in salivary glucose levels reported by Sharon *et al.*, [23]. Diabetics have lower levels of salivary amylase than non-diabetics. Streptozotocin-treated rats had lower levels of parotid gland amylase and amylase mRNA, but insulin therapy raised amylase levels prior to any change in mRNA levels[24], which was in agreement with our findings. This data suggests an early impact on protein translation and maybe a long-term transcriptional effect[25]. People with poorly controlled noninsulin-dependent diabetes who had increased amylase activity had changed taste sensations. Amylase levels in the saliva of diabetics have yet to be established as a reliable indicator. Diabetes patients' salivary amylase levels were found to be significantly greater than those of the controls, as reported by Yavuzylmaz et al. and by Chatterton RT et al. In the research by J. Tenouvo *et al.*, [26], no variations were seen in the amylase activity across the study groups.

The findings of this investigation indicated that diabetics had considerably higher amounts of salivary total proteins. Microorganism activity or periodontal tissue-derived proteins may be to blame for a rise in salivary protein levels. Exocrine gland proteins may be more likely to enter secretions in people with diabetes if the basement membrane is more permeable, according to Mandel's hypothesis[10]. Even while diabetics' salivary protein concentrations have been reported to be greater than those of non-diabetics in certain investigations, this has not been the case in other studies. Proteins released from gingival fluid rather than saliva have been associated to high levels of active periodontal disease in diabetics, according to research[4].

Sodium and potassium levels in diabetics were greatly high, whereas calcium levels were dramatically lowered, according to the findings of our research. T2DM and IDDM (Insulin Dependent Diabetes Mellitus) patients had considerably higher potassium levels in their saliva than healthy controls, too[4]. As a result of either hyperaldosteronism or a decreased Na⁺-K⁺-ATPase function, diabetic individuals may have abnormally high potassium levels in their salivary glands. Harrison *et al.*, [27] found that potassium levels were in agreement, however calcium levels were in disagreement.

Researchers have looked at the possibility of using saliva instead of plasma to diagnose or monitor type 2 diabetes by evaluating the extent of changes in saliva's composition. Cellular and chemical studies of blood components are the most frequently utilized laboratory diagnostic methods. When it comes to fluids in our bodies, saliva has several unique benefits over other fluids. An examination of salivary gland secretions is a primary tool for determining the particular disease of the glands, such as infection and blockage.

The most common use of a salivary analysis for the assessment of systemic illnesses is the study of entire saliva. In certain cases, systemic illnesses impact the salivary glands in such a way that they not only change the amount of saliva produced, but also its makeup. Like T2DM, these disorders may be diagnosed and detected earlier if they have a distinctive set of symptoms. Because of its simplicity, reliability, and lack of harm, saliva has lately been utilized to make diagnoses for a broad variety of disorders[10].

Individuals with little training may collect whole saliva non-invasively. For its collection, there is no need for any particular equipment. Children and the elderly may benefit from saliva testing for illness diagnosis since saliva collection is linked with less compliance issues than blood collection. In addition, salivary analysis seems to be a cost-effective strategy for screening huge groups of people.

Because of the limited sample size, we were unable to draw any firm conclusions on the changes in salivary parameters that occur in diabetics in this research. Fasting plasma glucose levels were linked to a variety of salivary indicators, including glucose, although a larger sample size would have allowed us to draw more certain conclusions. In addition, analysing the HbA1c levels of the participants' glycaemic controls would have added value.

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USE OF CYTOFLAVIN FOR THE COMPLEX THERAPY OF PATIENTS SUFFERING FROM THE PRIMARY OPEN-ANGLE GLAUCOMA**Tuychibaeva D.M.,***Doctor of Dental Medical Sciences, Associate Professor of the Department of Ophthalmology,
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Uzbekistan, Tashkent, 100047, Yashnabad district, Makhtumkuli street 103*[DOI: 10.5281/zenodo.7747265](https://doi.org/10.5281/zenodo.7747265)**Abstract**

The term "glaucoma" unites a large group of eye diseases of various origins with a progradient, chronic course.

The aim of this study was to study the neuroprotective effect of Cytoflavin in patients with POAG with normalized IOP based on the clinical and functional parameters of the organ of vision.

Material and methods. The study involved 60 patients diagnosed with primary open-angle glaucoma (POAG) stage I, II and III. All patients were divided into 2 groups depending on the treatment received.

Results. Cytoflavin has a pronounced neuroprotective effect in POAG, effectively protecting the nervous tissue and slowing down apoptosis. In addition to improving the clinical and functional indicators of the organ of vision, we noted an improvement in overall well-being, attention and overall performance in all patients.

Conclusions. Analysis of the obtained results indicates a rather high clinical efficacy of Cytoflavin in the conservative treatment of patients with POAG with compensated IOP and can be recommended as a background neuroprotective therapy.

Keywords: primary open-angle glaucoma, neuroprotective treatment, Cytoflavin, visual functions, glaucoma process.

Actuality. Glaucoma has become one of the leading medical and social problems of modern healthcare, growing in importance from year to year. According to literary sources, glaucoma is one of the most common diseases of the organ of vision and has a high medical and social significance, often leads to blindness and low vision, and is the leading cause of disability due to ophthalmic pathology.

The term glaucoma refers to a large group of eye-diseases of various genesis with progradiental chronic course. As a rule, glaucoma is concomitant to increase of the intraocular pressure (IOP), except for glaucoma with low (so-called – pseudo glaucoma) pressure, developed optic neuropathia having characteristic altered manifestations in the retinal fibres of the optic nerve capitulum and progressive worsening of the visual functions resulting in the development of typical defects of the visual field [1,3].

The primary open-angle glaucoma (POAG) is the chronic disease effecting mostly the working-age population and the elder groups. Among all types of glaucoma cases this type of the disease is more numerous and constitutes 80% of the total number of the cases [2]. Every year one person of every 1000 ones of the 40-45 years old groups falls ill. Nowadays about 60-70 millions of patients of the world suffer from glaucoma and every ten one of them have already become blind. In Uzbekistan in 2021 the incidence rate of POAG was 1.6% [16,18]. For the period from 2012 to 2021 in the Republic of Uzbekistan, the number of people recognized as disabled for the first time due to glaucoma increased by 2.5 times, the number of people with general disability increased by 1.3 times [15,17,19].

Depending on the stage of the glaucomatosis a part of nerve fibres of the optic nerve undergoes atrophy and the other part of them is at the parabiosis state. It allows to hope that restoration of their functions is possible by the therapeutic or surgical methods of treatment [5,6].

Nowadays the therapeutic treatment of glaucoma is carried out in three main directions:

- the therapy aimed to decrease the intraocular blood pressure (IOP);
- the therapy providing improvement of blood supply in the internal ocular layers and the intraocular part of the optic nerve;
- the therapy aimed to normalize metabolism in the eye tissue by effecting the dystrophic processes being typical for glaucoma (neuroprotective therapy) [4,8].

As it was truly marked by T.Yamamoto in 2001, the neuroprotective therapy of glaucoma would become the basic therapy used for the treatment of this serious disease in the nearest future.

The essence of the neuroprotective treatment is to prevent the cascade of reactions defecting the neurons, mainly being the result of the ischemia development. It should be pointed out that it concerns namely, the consequently developed reactions in which new and new neurons are involved in the pathologic process unless the defected tissue surrounding them becomes the source of the pathologic processes. That is why the neuroprotective treatment should be carried out within the limits of the so-called therapeutic frame (window) before the effected nerve tissue has not become irreversible [9].

In a number of papers published by foreign scientists the efficiency of "Cytoflavin" (POLYSAN NTFF LLC (Russia)) used for the restoration of the optic functions in patients suffering from the primary open-angle glaucoma have been described [9,12,14]. Cytoflavin enhances the intensity of aerobic glycolysis, which leads to the activation of glucose utilization and β -oxidation of fatty acids, and also stimulates the synthesis of γ -aminobutyric acid in neurons. It also increases the resistance of the membranes of nerve and glial cells to ischemia, which is expressed in a decrease in the concentration of neurospecific proteins that characterize the level of destruction of the main structural components of the nervous tissue, improves coronary and cerebral blood flow, activates metabolic processes in the central nervous system, preventing cell death, affects the mechanisms of apoptosis and improves the transmission of nerve impulses in cholinergic neurons [10,11,13].

Considering the pathogenetic basis the aim of our research work was to study the neuroprotective influence of Cytoflavin drug on the patients with POAG having normalized IOP basing on the clinic and functional data of the visual organ.

Material and methods. Sixty patients (38 women and 22 men), their average age was $60,75 \pm 12,83$ with the diagnosed open-angle glaucoma at I, II, III stages. The disease duration was from 6 months to 10 years, in average $3,1 \pm 0,6$ years. The examined patients included in this group were the patients whose IOP was achieved either by drug therapy or surgery and did not undergo neuroprotective treatment during the last six-months period.

All the patients were divided in two groups – basic and control ones. Both groups of patients were representative by their basic clinical indications. The control

group included 28 patients (47 eyes) who were given the routine traditional therapy: 1% solution of Emoxypine in 1,0 ml dose parabulbarly; 10% solution of Pyracetam 5,0 ml dose intravenously; 1% solution of Riboflavine mononucleotide in 1,0 ml dose, 5% solution of Pyridoxine hydrochloride in 1,0 ml dose, 5% solution of Ascorbic acid in 2,0 ml dose intramuscular injection for 10 days; One pill of Cavinton 3 times a day, Aevit one pill three times a day during one months.

The basic group included 32 patients (52 eyes) and were treated by the traditional therapy and Cytoflavin (Cytoflavin® POLYSAN NTFF LLC Russia), which was administered intravenously in isotonic solution for 10 days, at a dose of 10 mg/day.

All the patients were examined by: visometria with the optimal correction, biomicroscopia, computer perimetria on the Humphrey field analyser (HFA II 740), gonioscopia, tonographia, eye- bottom examination with Volk lens, optic cocherred tomography (OCT), defined the threshold of the optic nerve electric sensitivity and lability by phosphene, controlled the patient's adherence to the treatment.

There were specified side effects, keeping to the instillation regime, change in the patientis self-appraisal of his (her) mood and state.

The clinical efficiency of the treatment has been estimated by: visual acuity (V.A), mean deviation of the retinal photosensitivity in the central zone, threshold of the phosphene electric sensitivity (ThPhES) critical frequency of phosphene fusion flickers (CFPh F.F) at the "3,0" regime.

Results and Discussion

Good local and systemic durability to Cytoflavin was observed at every stage in the course of treatment.

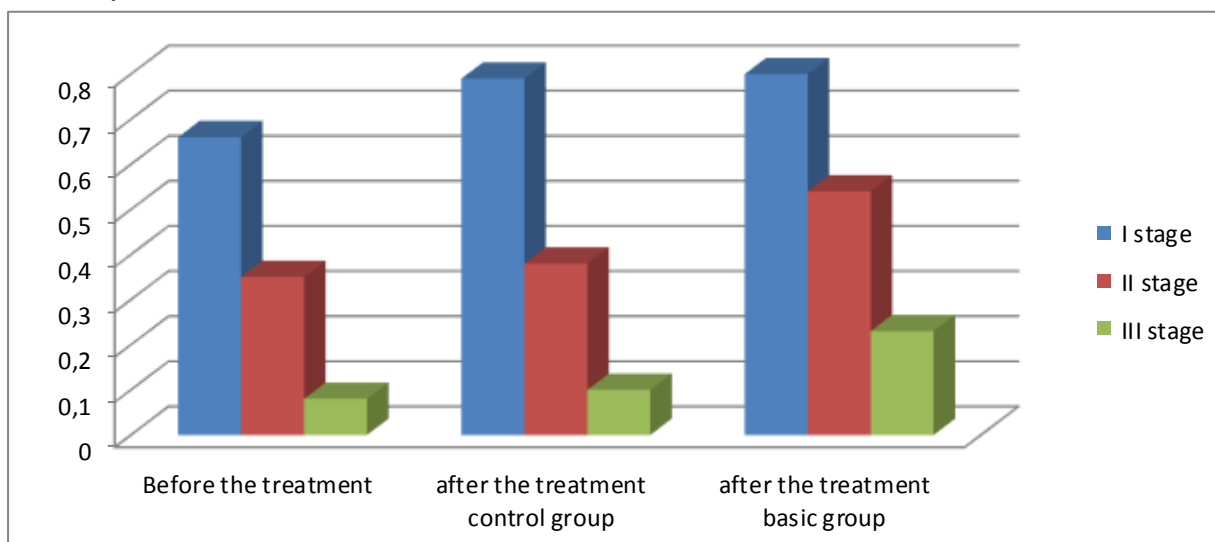


Fig.1. The visual acuity dynamics before and after the treatment

Note: p – reliability of various indices if compared to that before the treatment at the same stage of POAG

It is demonstrated on fig.1 that V.A of patients of the basic group has reliably improved after the therapy and was $0,80 \pm 0,02$ at the first stage of the disease; $0,54 \pm 0,02$ at the second stage and $0,23$ at the third stage. The V.A of patients in the control group was: $0,79 \pm ,02$ at the first stage; $0,38 \pm 0,02$ at the second stage and

$0,10 \pm 0,02$ at the third stage. There was noted some improvement of the eye-vision in this group but the indices are not reliable ($p > 0,05$).

Thus, treatment of the patients with POAG by the drugs according to the scheme elaborated by us, the V.A has reliably improved to $0,08 \pm 0,2$, that is four

times higher than that after the traditional therapy. This is, by our opinion, the result of correct selection of the drugs combinations, taking into consideration the continuity of the therapeutic effect and their synergism. It is known that V.A at POAG is not the objective indicator for GON but nevertheless it influences essentially on the patient's life quality.

The functions of the inner layers of the retina and the axial band of the optic nerve have been estimated by the method used for definition the ThPhES and electric lability by phosphene (CFPhFF) in the examined patients suffering from POAG.

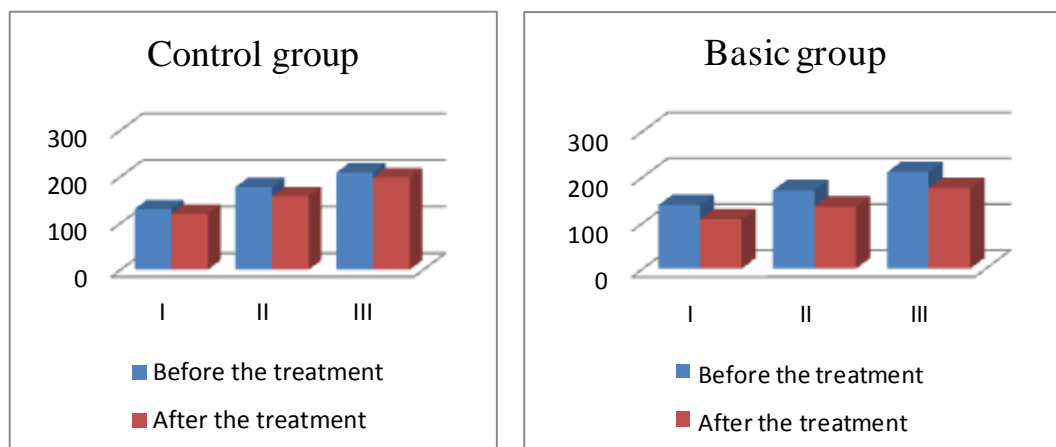


Fig.2. Change in the Threshold of electric sensitivity by Phosphene

Note: p – reliability of various indices if compared to that before its treatment at the same stage of POAG.

It is demonstrated in the fig.2, that in the basic group of patients with the first stage of POAG the threshold of electric sensitivity to phosphene was $138,8 \pm 9,3 \mu\text{kA}$ before the therapy, after the treatment the index became reliably lower ($p < 0,001$) (by 22,7%) and was $107,3 \pm 6,4 \mu\text{kA}$ if compared to that of prior the treatment at the same stage of the disease designated as 100%; at the second stage of POAG the index was $170,8 \pm 13,0 \mu\text{kA}$ before the therapy and after the therapy it has reliably ($p < 0,001$) decreased (by 20,7%) to $135,4 \pm 10,9 \mu\text{kA}$ if compared to the indices before the treatment at the same stage of the disease designated as 100%. At the third stage of POAG the index before the therapy was $210,7 \pm 17,2 \mu\text{kA}$ and after the treatment it has become reliably lower ($p < 0,001$) (by 17%) to $175,6 \pm 12,8 \mu\text{kA}$ if compared to that of prior the treatment at the same stage of the disease designated as 100%.

In the control group at the first stage of POAG the ThPhES index was $130,0 \pm 7,0 \mu\text{kA}$ before the treatment and after the treatment it has reliably ($p < 0,001$) decreased (by 7,6%) if compared to the indices before the treatment indicated as 100% and was $120,1 \pm 6,5$

μkA ; at the second stage of POAG before the therapy index was $177,4 \pm 11,3 \mu\text{kA}$ and after the treatment it has become insignificantly lower ($p < 0,05$) to $157,9 \pm 11,6 \mu\text{kA}$, by 10,9% lower if compared to that designated as 100%; at the third stage of POAG the index was $208,7 \pm 16,5 \mu\text{kA}$ before the treatment and after that it has become significantly lower ($p < 0,05$) to $198,5 \pm 16,8 \mu\text{kA}$, by 4,9% less if compared to the indices before the treatment at the same stage of the disease.

It was revealed that if the first drug recommended to the patient were droplets of the Prostaglandine analogues group the ThPhES index was usually less than that in the other groups. This is obviously the result of achievement the target pressure more quickly and retaining the electric sensitivity of nerve fibres and also the neuroprotective effect of the drug itself. The ThPhES higher efficiency we have noted also in patients of the basic group with less period of the POAG disease duration who was given the combined therapy during course of complex treatment. The results of investigation of the C Ph FFF indices of the examined patients with POAG are presented in fig.3.

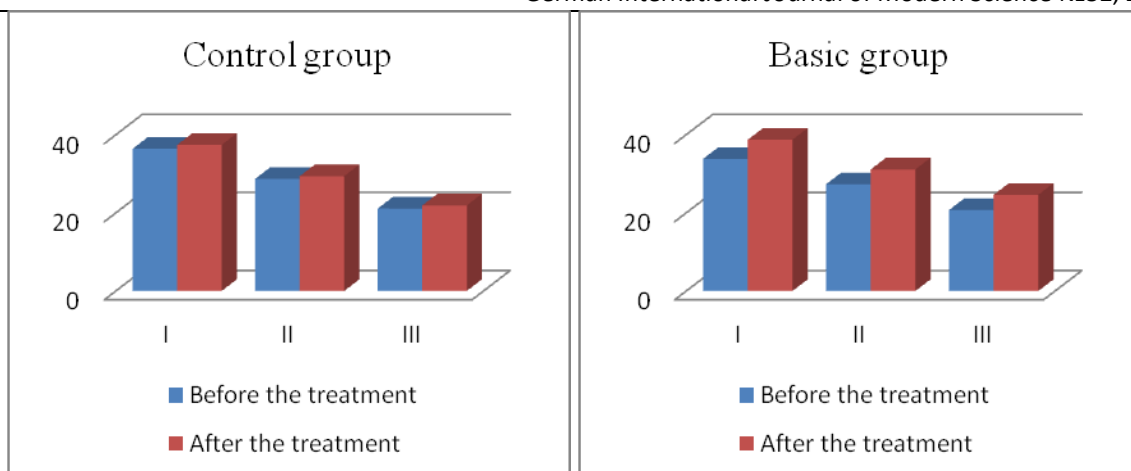


Fig.3. Changes in the CPhFFF in patients with POAG

Note: p – reliability of the index differences when compared to that before the treatment at the same stage of POAG

Fig.3 demonstrates the reliable growth of the CPhFFF indices by 14,5% in average (before the treatment – $33,8 \pm 1,5$; after the treatment – $38,70 \pm 0,87$) at the first stage and by 13,9% at the second stage (before the treatment – $27,30 \pm 0,76$; after the treatment – $31,1 \pm 0,5$) while in the control group it was by 2,7 and 2,4% respectively if compared to the indices before the treatment at the same stage of the disease, indicated as 100%. It is reliably lower than in the patients of the first group, treated by the recommended by us therapy. This

indicates the reliably higher activation of the retinal ganglions cell and their axons in the patients of the basic group.

Thus, use of the Cytoflavin in the complex therapy for the patients with POAG helps to activate to a greater degree the visual analyzer.

The results of investigation of the threshold sensitivity of the retina (dB) according to the data obtained by the computer statistic Humphrey perimetria are given in fig.4.

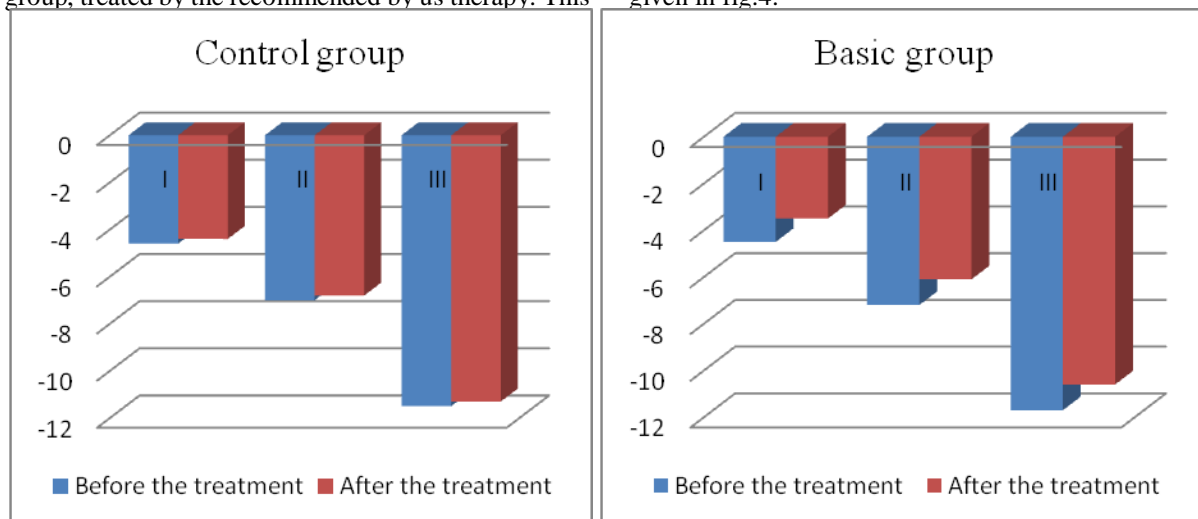


Fig.4. Change of the retinal threshold sensitivity obtained by the computer statistic Humphrey perimetria

Note: p – reliability of the index's distinction in comparison with its value prior the therapy at the same stage in POAG.

Fig.4 demonstrates that in patients with POAG at the first stage the threshold of retinal sensitivity was $4,50 \pm 0,08$ dB before the treatment, after the treatment the index increased reliably ($p < 0,001$) by 22,2% and was $3,50 \pm 0,07$ dB; at the stage II the POAG index before the treatment was $7,20 \pm 0,08$ dB, after the therapy the index increased ($p < 0,001$) by 15.3% and was $6,10 \pm 0,09$ dB if compared to that before the treatment at the same stage of the disease indicated as 100%; at the third stage the POAG index prior the therapy was $11,7 \pm 0,09$ dB and after the treatment increased ($p < 0,001$) (by 9,4%) to $10,6 \pm 0,08$ dB if compared to the index before the treatment at the same stage of the disease.

In the second group (fig.4) at the first stage of POAG the threshold of the retinal sensitivity was $4,6 \pm 0,1$ dB before the treatment and after the treatment the

index ($p < 0,05$) increased (by 4,3%) and was $4,40 \pm 0,09$ dB; at the second stage of POAG the index before the treatment was $7,00 \pm 0,13$ dB and after the therapy it increased ($p > 0,05$) to $6,8 \pm 1,4$ dB being by 2,9% higher if compared to the index before the treatment at the same stage of the disease taken for 100%; at the third stage of POAG the index before the therapy was $11,5 \pm 0,13$ dB, and after the treatment it elevated ($p > 0,05$) to $11,3 \pm 0,08$ dB which was by 1,7% higher if compared to the data before the treatment at the same stage.

According to the data obtained by computer statistic Humphrey perimetria, there was increase in the photosensitivity of retina, decrease in quantity, size and depth of the scotoma, widening the area with normal photosensitivity in patients of the basic group (fig.5).

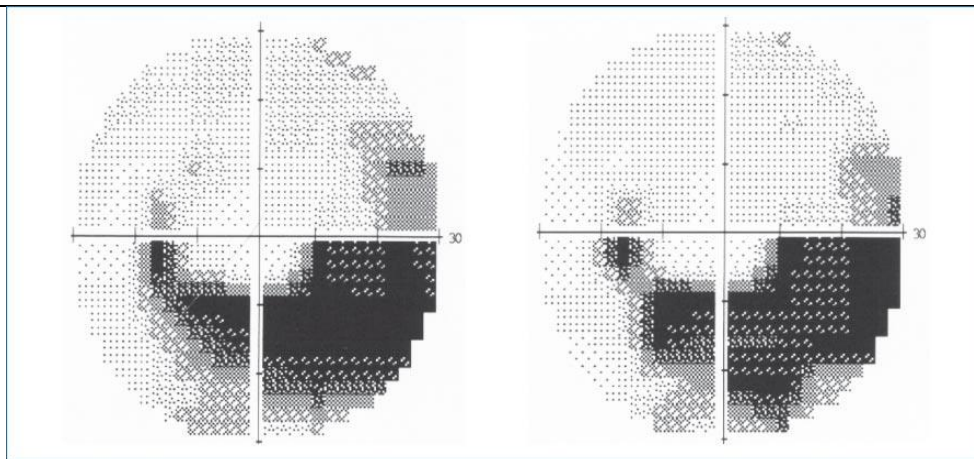


Fig.5.

Humphrey perimetria of the left eye of the patients with second stage of POAG before and after the treatment.

Thus, Cytoflavin induces marked neuroprotective effect at POAG, rendering the effective protection of the nerve tissue and slow down the apoptosis. Besides the improvement of the clinic and functional indices of the visual organ we have observed the improvement of the general feeling, attention and working ability in all the patients.

Conclusion:

1. Analysis of the obtained results indicated to high enough clinic efficiency of Cytoflavin drug for the conservative treatment of patients with POAG and compensated IOP.

2. This drug might be recommended as the background neuroprotective therapy.

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PEDAGOGICAL SCIENCES

DEVELOPMENT OF ECONOMIC STUDENTS THINKING IN TEACHING THEORY OF PROBABILITY AND ELEMENTS OF MATHEMATICAL STATISTICS WITH “PRACTICAL-PROFESSIONAL ORIENTATION”

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Abstract

The training of economists and the development of their professional competence are directly related to the study of economics as well as mathematics, in particular, the study of probabilistic-statistical methods. Therefore, probability theory and mathematical statistics play an important role in the development of students' economic thinking. The teaching of this science also has its own problems. This article is based on the relevance of teaching probability theory and mathematical statistics based on the concept of "practical-professional orientation", and the mechanisms for implementing this process are presented with enough examples and problems.

Keywords: probability theory, mathematical statistics, economics, practical-professional issues, problematic practical-professional issues.

Introduction

The training of economists in higher education institutions and the development of their professional competence are directly related to the study of economics as well as mathematics, in particular, the study of probabilistic and statistical methods. Because the outcome of many economic processes depends on many random factors and uncertainties. For example, in production, the relationship between product quality, the consumption of raw materials and labor productivity, daily sales revenue and income are modeled on the basis of probabilistic-statistical analysis and methods. Internal and external variables in each economic process, that is, variations, are studied on the basis of the variational characteristics of these socio-economic phenomena, the laws of their development are determined by probability theory and mathematical statistical methods. The analytical conclusions are evaluated with a certain degree of probability, which means that the results of certain tests can be considered reliable [1], [12].

In the observation of socio-economic phenomena, the mathematical probability of an event is expressed in the form of a statistical law with a stable relative repetition rate. This is the result of the application of probability theory and the law of large numbers of mathematical statistics for socio-economic events under certain conditions. In probability theory, a mathematical model of an economic process is designed, while in mathematical statistics, we construct a mathematical model of economic processes based on the influence of some random factor and analyze its aspects of interest. In this sense, mathematical statistics aims to construct a theoretical probabilistic model of the economic process being studied using its inference methods.

Probability theory and the content of mathematical statistics, which are aimed at training future economists, and the issues of training are not without some problems. In particular, the impact of the

principle of “practical-professional orientation of teaching” on the development of professional competence has been little studied. The content of education and the availability of existing teaching aids are not adequate. Probabilistic-statistical models and practical-professional issues are not systematically reflected in the content of mathematics education. Students who have mastered the pure mathematical content face difficulties in analyzing economic processes and solving and modeling professional-practical problems.

Literature review

Theoretical and methodological bases of teaching and studying probability theory and mathematical statistics in the Republic of Uzbekistan, the issues of improving teaching methods have been studied by I.M. Gaysinskaya, H. Ochilova, J. Kudratov, D.V. Manevich, U.X. Khonkulov [7], [11], [12], [16], [17].

H. Ochilova's research is aimed at developing probabilistic-statistical thinking of students in grades 4-8. The researcher argued that students' probabilistic-statistical thinking depends on their ability to predict and evaluate.

The research of I.M. Gaysinskaya, D.V. Manevich, J. Kudratov is aimed at the selection of probabilistic and statistical materials at school, the organization of optional classes.

U.X. Khonkulov's research promotes the idea of teaching the elements of the stochastic direction of mathematics on the basis of an approach based on interdisciplinary connections and the internal integration of the subject. The content of a special course "Elements of combinatorics, probability theory and mathematical statistics" for academic lyceums "Exact sciences" and "Natural sciences" was developed and put into practice. A set of methods based on internal integration in solving problems related to probability theory and mathematical statistics is proposed.

N.V. Panina, A.G. Elenkin, E. Alexandrova, I.N. Konovalova, S.O. Dolgoplova, R.Sh. Khusnutdinov,

Y. Abdullaev, N.M. Soatov and others have conducted a number of studies [9], [18], [19].

Research methodology

Mathematics education begins with specific practical experiences, exercises, and moves to abstract concepts. Professional experience is formed in practice. In this sense, the "practical-professional orientation of teaching" is of particular importance in the study of probability theory and mathematical statistics.

In pedagogical research, the term "practical orientation of teaching" is defined as "the formation of knowledge, skills and competencies in the use of mathematical apparatus in solving specific practical problems through the implementation of appropriate content and methodological connections of mathematical education" [3], [9], [12].

In most scientific sources, the terms "practical orientation of teaching" and "professional orientation of teaching" are used in parallel, and they are the same concepts that complement each other. Authors such as G.V. Dorofeev, L.V. Kuznetsova, V.V. Firsov say that "the professional orientation of teaching is the content, form and methods of teaching mathematics in a particular professional activity; and the practical orientation of teaching is the production of practical exercises, the solution of professional problems."

The analysis and generalization of different views led us to the following definition:

Practical-professional orientation of teaching - the type of educational activity, the content, form and means of education, including practical training for the formation of professional competence. As a result, a well-developed personality of a specialist ready to dynamically solve professional problems is formed [5], [6].

Probability theory and mathematical statistics in the professional training of future economists can be seen to be directly and indirectly related to the "practical-professional orientation of teaching" to practical-professional issues.

We believe that the content and structure of practical issues for economists should meet the following didactic and methodological requirements:

- Probability-statistical problem corresponds to the subject of mathematics, the relevance of the current dynamics of production, to include professional information;

- The text of the issue should be as short and clear as possible, aimed at the formation of systematic and consistent practical tasks and on this basis to solve real-life problems;

- compliance with the trend of formation of knowledge, skills and abilities of professional importance, to promote the development of professional competencies of future economists;

- The emergence of technical capabilities in the performance of calculations to obtain digital results, the use of special programs Excel, MathCad, Statistics and similar programs technical calculation tools.

Practical-professional issues should serve not to study a large amount of educational material, but to deepen the understanding of probabilistic-statistical

terms and facts, to develop the ability to apply theoretical knowledge in professional activities.

We have divided problems related to probability theory and mathematical statistics for economists into the following three types depending on the method of presentation.

1. Pure mathematical issues. Pure mathematical content that can be solved using mathematical formulas and concepts based on rigid algorithms issues.

We can say that the methods of solving such problems are ready and in practice not professional.

Here are some examples [4], [10], [14].

Example. Two hunters fired one at the wolf. The probability of the first hunter hitting the wolf is 0.7, and that of the second is 0.8. Find the probability that at least one arrow hits the wolf.

Solution: Let the event A shoot the first hunter's wolf, and let the event B shoot the second hunter's wolf. Apparently, events A and B are co-occurring but not related to each other. In that case

$$P(A + B) = P(A) + P(B) - P(AB) = P(A) + P(B) - P(A) \cdot P(B) = 0,7 + 0,8 - 0,7 \cdot 0,8 = 0,94.$$

2. Practical and professional issues. Mathematical problems related to professional activity.

The method of solving for practical-professional problems is formed, and the comparison of the values required to solve it requires only a little mental effort. As a result of solving this problem, professional competence is developed to a certain extent through the use of appropriate calculation formulas, that is, automatism is formed.

Here are some examples [10], [13], [15].

Example. In a large advertising firm, 21% of employees earn high salaries. 40% of the company's employees are women. At the same time, 6.4% of workers are high-paid women. Is there any reason to say that there is discrimination in the payment of women's labor in the company?

Solution: From the point of view of probability theory, the question can be asked: "How likely is it that a randomly selected female worker will receive a higher salary?" If we consider A the phenomenon of "randomly selected worker receives a high salary", B - the phenomenon of "randomly selected female worker", then:

$$P_B(A) = \frac{P(AB)}{P(B)} = \frac{0,064}{0,40} = 0,16$$

Since the number 0.16 here is less than the number 0.21, it can be concluded that women are less likely than men to earn higher wages in an advertising firm.

3. Problematic practical-professional issues. The problem is not stated in mathematical language, but is presented in the form of a problem. In this case, it is necessary to solve the required task, which is carried out through a practical activity, and as a result, a mathematical form of the problem is formed.

A number of questions need to be answered in problematic practical-professional issues. How to collect initial data, what to analyze when processing them, what mathematical formulas to use, etc.? Undoubtedly, such issues are most useful in terms of the formation of professional competence, from which begins to understand and solve the problematic situation.

Here are some examples.

Problem. Have each student form a series of events and determine the interrelationships of those events.

Sample issue. One of the customers who visited the "Ishonch" chain of stores was selected at risk. Let event A - he came to buy a TV set, B - he came to buy vacuum cleaner, C - he came to buy Artel TV set, D - he came to buy Artel vacuum cleaner, E - he came to buy Artel products. Determine the relationship between these events.

Solution:

All of these events come together in pairs. For example, a customer may have received a Samsung TV and an Artel vacuum cleaner, events A and D may be observed at the same time, or a customer may have received a vacuum cleaner and an Artel washing machine, events B and E may be monitored at the same time.

All of these events may be joint. It is possible that the customer came at the same time to buy an Artel TV, an Artel vacuum cleaner and an Artel washing machine. It is also possible to add that it would be wrong to say that only events A, B, C, D or E are observed for a randomly selected client.

The event C favors the event A . Because the fact that the customer is came to buy Artel TV means that he came to buy a TV.

The event C favors the event E . Because the fact that the customer is came to buy Artel vacuum cleaner means that he came to buy a Artel product.

The event D favors the event B . Because the fact that the customer is came to buy Artel vacuum cleaner means that he came to buy a vacuum cleaner.

The event D favors the event E . Because the fact that the customer is came to buy Artel vacuum cleaner means that he came to buy a Artel product.

Problem. An entrepreneur can bet on one or more businesses. Which choice do you prefer?

Sample issue. The entrepreneur wants to invest his available funds in the business. There are 2 different types of businesses that are recommended. These businesses are not related to each other and the probability that the money invested in both types of business will not pay off is the same 0.1. The entrepreneur is thinking about betting all his money on one business or splitting his money on two businesses. Which event is more likely: does money justify itself when betting on one type of business, or does money justify itself when betting on at least one type of business?

Solution:

A - the event that the money invested in the 1st business justifies itself;

B - the event that the money invested in the 2nd business justifies itself;

C -the phenomenon of money justifying itself in at least one when betting money on both businesses get

In that case it will be $C = AB + \bar{A}B + A\bar{B}$ and $P(C) = P(AB + \bar{A}B + A\bar{B}) = P(AB) + P(\bar{A}B) + P(A\bar{B}) = P(A)P(B) + P(\bar{A})P(B) + P(A)P(\bar{B})$.

As you know, $P(A) = P(B) = 1 - 0,1 = 0,9$ and $P(\bar{A}) = P(\bar{B}) = 0,1$. That is why $P(C) = 0,9 \cdot 0,9 + 0,1 \cdot 0,9 + 0,9 \cdot 0,1 = 0,99$. That is, $P(C) > P(A)$.

So, entrepreneur when betting money on both businesses, the probability that the money will justify itself in at least one is the same the money invested in the business is more likely to justify itself. In short, it is better to invest money in both businesses.

Analysis and results

We believe that the solution of problematic practical issues can be done in three stages:

Stage 1. At this stage, the condition and conclusion of the given issue are separated, the content and essence are clarified. What needs to be found is determined, and when the condition and conclusion of the issue are separated, a clear practical action is identified. Then the problem is reduced to a mathematical form.

Stage 2. At this stage focuses on planning and the choice of solution. What additional information is needed to apply it, a solution plan is identified, and implemented step-by-step. At this stage, if the information provided is sufficient to solve the problem, the method of solving it will be selected. If there is not enough information, it will be determined what additional information is needed and then a solution plan will be developed. On this basis, they gradually approach the right solution.

Stage 3. At this stage, the problem is solved according to the plan, errors are identified and corrected, and the solution is checked directly. At this stage, students understand the importance of professional issues on the basis of experience, practice, the importance of probabilistic-statistical methods.

Of course, in solving all types of problems, students will need to be able to apply certain properties, theorems and their results, to use different methods.

When solving problems, it is necessary to pay attention to the following:

- know and remember the basic concepts, definitions, properties and formulas of probability theory and mathematical statistics;

- be able to plan their activities in solving problems and determine what mathematical concepts can be used to solve the problem;

- understand the essence of the problem.

The above methodological recommendations should be applied at all stages of the process of solving practical professional problems: understanding the essence of the problem and taking the necessary practical actions, planning, problem solving and investigation.

Conclusion/recommendations

Explaining the course of probability theory and mathematical statistics for students majoring in economics with the help of problematic practical-professional issues will help them to develop their economic thinking, to solve problems in their work, to plan, forecast future activities in the field of economics. Helps to draw conclusions.

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PHILOLOGICAL SCIENCES

REVIEW OF THE STUDY OF TRANSLATIONS OF THE LYRICS OF THE TATAR POET GABDULLA TUKAY INTO RUSSIAN

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ОБЗОР СТЕПЕНИ ИЗУЧЕННОСТИ ПЕРЕВОДОВ ЛИРИКИ ТАТАРСКОГО ПОЭТА ГАБДУЛЛЫ ТУКАЯ НА РУССКИЙ ЯЗЫК

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Abstract

Tatar poet Gabdulla Tukai (1886-1913) occupies an exceptional place in the history and culture of the Tatar people. He is considered a classic of Tatar poetry, the creator of the national cultural code. His influence on the development of Tatar literature continues to this day. Therefore, the study of the heritage, as well as translations of Tukay's lyrics into Russian, is still relevant today, which is considered based on the parameters of the national identity of literature, manifested in the work of the Tatar poet.

Аннотация

Великий татарский поэт Габдулла Тукай (1886 – 1913) занимает в истории и культуре татарского народа исключительное место. Он считается классиком татарской поэзии, создателем национального культурного кода. Его влияние на развитие татарской литературы продолжается и поныне. Поэтому изучение наследия, а также переводов лирики Тукая на русский язык актуально и сегодня, которое рассматривается с исходя из параметров национальной идентичности литературы, проявившейся в творчестве татарского поэта.

Keywords: Gabdulla Tukai, lyrics, literary translation.

Ключевые слова: Габдулла Тукай, лирика, художественный перевод.

Активно переводить лирику Габдуллы Тукая сначала на русский язык, а затем и на другие языки России и мира, начали только после его ранней смерти в 1913 году. Среди переводчиков поэзии Тукая были многие известные русские поэты. До сих пор продолжается активная работа по переводу произведений Габдуллы Тукая на русский язык, и каждый год выходят сборники поэзии Габдуллы Тукая.

Между тем история переводов стихотворных произведений Г. Тукая на русский язык стала предметом комплексного литературоведческого исследования только в 20-е годы XXI века, когда впервые была написана и защищена кандидатская диссертация Газизовой Л.Р. «Лирика Г. Тукая в переводах на русский язык: история и поэтика». До этого существовали лишь точечные исследования, посвящённые переводам произведений Тукая, преимущественно лингвистического характера. Избранную хронологию переводов лирики Г. Тукая, выполненных в советский период, даёт Н.Х. Лаисов [Лаисов, 2002]. Он приводит статистические данные о количестве переводов стихотворений, включённых в издания разных лет. Это исследование стало одной из первых работ, в которой начинает рассматриваться история переводов выдающего татарского поэта.

Все работы, в которых рассматриваются переводы лирики Тукая, можно разделить на те, которые посвящены анализу языковых особенностей, и на другие, сосредоточенные на способах передачи идейно-художественных особенностей оригинала в переводе, в аспекте межкультурной коммуникации.

Переводы лирики Тукая на русский язык рассмотрены с лингвистической точки зрения в работах А.И. Коновой, С.Х. Айдаровой, Л.М. Гиниатуллиной, Л.Г. Латфуллиной, А.Г. Талиповой, М.И. Хитёвой и Л.А. Юнусовой. В них анализируются средства выразительности переводов лирических произведений Тукая на русский язык. Переводы стихотворных произведений Тукая на русский язык рассматриваются также и в контексте переводов на другие языки мира.

Важными ключами к пониманию национальных культур, объединяющих народы на основе их общей истории, становятся культурные коды. А.Х. Ашрапова, Л.Х. Шаяхметова и Л.Р. Мухаметзянова считают, что сохранение татарского национального кода должно базироваться на изучении и популяризации татарской поэзии и в первую очередь лирики Г. Тукая [Ашрапова, Шаяхметова, Мухаметзянова, 2016].

Исследователь Д.Ф. Загидуллина сделал вывод, что в произведениях Тукая традиционные сюжеты и мотивы перекодируются под влиянием актуальной парадигмы начала века. Служение Богу переходит в служение народу. В общественной мысли начала XIX века меняются представления о задачах литературы, которые исследовал классик татарской литературы Фатих Амирхан. «В амирхановской оценке поэзия Тукая есть самосознание татарского народа, выражение его духа» [Загидуллина, 2001, с.30].

Г.А. Аманова показывает вклад Анны Ахматовой в развитие переводческой школы, выявляет новаторство и особенности ее переводческого стиля. «Ахматова своими переводами из поэзии Габдуллы Тукая продемонстрировала приемы, способствующие сохранению жанровых признаков оригинала, индивидуальную стилистику татарского поэта и собственно колорит восточной поэзии. Замечательная переводчица не стремилась к буквализму брюсовского типа, но нередко даже к произведениям талантливых поэтов добавляла и частицу своего собственного таланта» [Аманова, 2019, с. 14].

Э.Ф. Нагуманова в переводах Ахматовой отметила сознательный уход от жанровых форм, например, от формы газели. Анализируя одно из самых известных стихотворений Г. Тукая «Өзелгән өмид» («Разбитая надежда», 1910), она отмечает: «Стихотворение передано в традициях силлаботонического стихосложения, перевод осуществлен 7-стопным хореем, который в принципе по ритмическому строению близок к излюбленному метру Тукая рамалю. В переводе отдельных бейтов сохранено даже количество гласных звуков. А. Ахматова, благодаря особой напевной интонации, смогла передать трогательно-сентиментальное отношение татарского поэта к своей матери, однако в переводах некоторых бейтов традиционная напевность тюркского стиха не передана» [Нагуманова, интернет-ресурс].

А.З. Хабибуллина установила, что поэзия Г. Тукая стала сферой выражения диалога литератур: его газель «Өзелгән өмид» («Разбитая надежда», 1910), а также другие стихотворения передают то художественное содержание, которое коррелирует с элегическим тоном русской поэзии XIX века. В работе доказывается, что благодаря переводам на татарский язык элегий Пушкина и Лермонтова Г. Тукай смог создать в своем творчестве те образы и темы, которые близки к изучаемому жанру и его модальности [Хабибуллина, 2018, с. 304-308].

Некоторые исследователи обращались к переводам Тукая русской поэзии, поскольку они позволяют определить истоки мотивов и поэзии самого татарского поэта. М. Ибрагимов и Г. Гумеров исследуют трансформации некоторых мотивов стихотворений русских поэтов XIX-XX вв. в вольных переводах Г. Тукая. Они установили, что в лирических произведениях Тукая мотивы переводимых произведений подвергаются количественным (редукция, приращение мотивов) и качественным изменениям (семантическая трансформация мотивов). Трансформации мотивов в процессе перевода

обусловлены понятийно-смысловыми лакунами (отсутствием в татарском языке и культуре отдельных понятий и концептов, определяющих семантику мотивов переводимых стихотворений), ориентацией на горизонт ожидания татарского читателя, формировавшийся на основе рецепции восточной поэзии [Ибрагимов, Гумеров, 2018, с.22-25].

Достаточно часто исследователи фокусировали своё внимание на достоинствах и недостатках переводов отдельных лирических произведений татарского поэта. Р.Р. Мусабекова рассматривает 4 варианта перевода стихотворения «Кыйтга», выполненных С. Липкиным, М. Львовым, Н. Ахмеровым и Л. Рустом и заключает, что «всем переводчикам присуща высокая культура стиха, близка выразительность русской речи... налицо полное отсутствие ощущения "переводности", и все четыре перевода один дополняет другой» [Мусабекова, 2015].

Э.Ф. Нагуманова анализирует национальное и интернациональное в одном из самых известных и любимых татарскими читателями стихотворений «Родной язык». Тот же автор в статье «Жанровые трансформации в переводах стихотворений Г. Тукая на русский язык» прослеживает тенденции трансформации жанров в поэзии Тукая, порождающие проблему идентификации жанра произведения [Нагуманова, 2016].

Стихотворение «Родной язык», ставшее неофициальным гимном татар всего мира, неоднократно становилось объектом исследования. Р.З. Хайруллин и И.А. Таирова сравнили переводы стихотворения Г. Тукая «Родной язык», выполненные С. Липкиным, А. Чепуровым и Р. Бухараевым. Переводы анализировались с точки зрения соответствия оригиналу и адекватности использования средств художественной выразительности, привычных для русскоязычного читателя, постигающего национальную картину мира, созданную татарским поэтом. Сравнив три из многочисленных переводов на русский язык знаменитого стихотворения Г. Тукая, исследователи пришли к выводу, что художественный перевод настолько специфичен, что не может быть единственным однозначно верного перевода. У каждого из рассмотренных переводов авторы отметили и достоинства, и недостатки. Но все три стихотворных перевода лаконично звучат на русском языке, сохраняя основные смыслы и поэтические достоинства стихотворения и языка татарского поэта [Хайруллин, Таиров, 2021].

Многие лирические стихотворения Тукая становились любимыми татарским народом песнями. Д.Э. Нигматуллина рассматривает специфику оригинальных песенных текстов и их перевод на русский язык. Автор делает вывод, что песни на стихи Тукая продолжают народную песенную традицию, обогащая её новым содержанием.

И.А. Еникеев анализирует переводческую деятельность Р. Бухараева, который в достаточной степени овладел татарским языком только лишь в сознательном возрасте. Поэтому в переводах татарской поэзии он видел определённую миссию. Переводы лирических произведений Тукая стали

для Бухараева оправданием его оригинального творчества на русском языке [Бухараев, Казань, 2011]. Также рассмотрена проблема интеграции национальных литератур в русскоязычное пространство, являющейся одной из самых актуальных проблем российской современности. Данный анализ проводится на примере перевода лирических стихотворений Г. Тукая, выполненные поэтом-переводчиком Р. Бухараевым [Еникеев, 2017, с.95-98].

Л.Р. Газизова трактует языковую картину мира как фактор множественности переводов, выявляя причины, влияющие на отражение картины мира в поэзии Г. Тукая, присущей татарской культуре конца XIX начала - XX века. Рассмотрены религиозные взгляды татарского народа, а также причины зависимости татарского языка от арабского и тюркских языков, которые стали важнейшими дополнительными факторами множественности переводов поэзии великого татарского поэта [Газизова, 2020, с.422-424].

А.М. Саяпова на примере творчества Г. Тукая, а также русских и европейских поэтов начала 20 века рассматривает проблему перевода (интерпретации) в аспекте его пассионарности [Саяпова, 2016, с.155-158].

Изучение истории переводов лирических произведений Габдуллы Тукая, подчиненное выявлению сменяющихся тенденций, этапов, проблем, национальных переводческих традиций, дает возможность не только расширения существующей системы понятий, но и помогает оценить значимость самого факта перевода в процессе взаимодействия национальных культур и литератур, выявить некоторые его закономерности, равно как и закономерности процесса переводческой деятельности.

Русскоязычный читатель, не знающий татарского языка, может познакомиться с творчеством Г. Тукая только в переводах его произведений на русский язык, поэтому необходим анализ структурно-содержательных особенностей переводных текстов не только в аспекте межлитературной коммуникации, но и диалога.

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PHYSICAL SCIENCES

SOLVING PROBLEMS OF QUANTUM MECHANICS BY METHODS OF INTEGER THEORY

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Abstract

In the present review of the author's works, the calculation of the radiation spectrum of a hydrogen-like atom is described in detail using the principle of commensurability of conserved quantities, which is introduced by the author. The result obtained allows us to give a clear physical interpretation of Bohr's quantum hypothesis. It follows from the data obtained that the "resolved" states of quantum systems are the result of the need to fulfill the requirement of having a common measure of conserved quantities for all participants in physical interaction before and after interaction.

Keywords: principle of commensurability of conserved quantities, radiation spectrum of a hydrogen-like atom, Bohr quantization hypothesis, integer theory, resolved states of quantum systems, principle of causality

1. Introduction

Modern quantum mechanics and quantum physics successfully describe the world in which we live. Now there is no problem like the "ultraviolet catastrophe", which at the beginning of the last century led to the emergence of a new mechanics - quantum. But the fact that such a successful science contains an element of "fatal inevitability" of the correctness of this theory, about which the outstanding physicists R. Feynman and S. Weinberg write in [1], cannot help but cause constant dissatisfaction. How to understand *the reasons* for the behavior of quantum systems, overcoming its "magic"?

In [2], one of the creators of quantum mechanics, M. Born, writes that "... *the main feature of the new mechanics, obviously, is that some physical quantities can only take on discrete values, such quantities are called quantum.*" The concept of quantization was introduced into physics, as is known, by N. Bohr and M. Born further writes: "... *although the Bohr theory leaves the deep reasons underlying the momentum quantization rule completely mysterious, nevertheless, this rule turns out to be justified by the results obtained in the process of further development of the theory*". In our opinion, this is the key phrase of an outstanding scientist for understanding how the "mysterious causes of quantization" are substantiated by modern science - namely, they are substantiated with the help of numerous results obtained by theory and later confirmed by experiment. This is precisely the criterion for the truth of the hypothesis proposed by Bohr. But if we carry out the calculation of a certain interaction with the help of "mysterious quantization", and then we get confirmation of the prediction of this calculation in an experiment, do we really understand *the physical reasons why* Nature is arranged according to quantum laws? By carrying out appropriate calculations, we are able to predict the behavior of objects, those we know *how* Nature works, but *why* it is arranged in a "quantum" way - we do not have an answer to this question. The very *reason* for the quantization of Nature remains still mysterious.

In order to unravel the true reason for the need to quantize the physical quantities of Nature, one more non-trivial step must be taken. It must be assumed that physical objects, when interacting with each other, exchange conserved quantities (energies, momenta, angular momentum, etc.) not in an arbitrary way, but in such a way that the conserved quantity (let the energy) of interacting objects have a common measure for energy values up to and after the interaction. What is the common measure for two (or more) quantities? This means that both quantities can be measured with the same "meter" and express their values in integers of units of measure. It has been known since ancient Greece that the diagonal and the length of a square do not have a common measure, and this is because the diagonal of a square has a length of $\sqrt{2}$, i.e. expressed as an irrational number. For this reason, the diagonal of a square and its side cannot be measured by the same "meter" - *they do not have a common measure*. It is also well known from any complete course in higher mathematics that two (or more) quantities *a* and *b* always have a common measure if their ratio *a/b* is expressed by a rational number. And the presence of a common measure for quantities makes it possible to express their values using integers (it can be said differently - *each* of the commensurate quantities can be used as a "meter", that is *each* quantity can measure any counterpart from the set of commensurate quantities). But if physical quantities can be represented in the form of integers, then to solve the problem of the interaction of physical objects, one can then apply the methods of the theory of integers.

Such a hypothesis, i.e. the hypothesis of the need to fulfill the conditions of commensurability of conserved quantities in the interaction of physical objects (which we call *the principle of commensurability of conserved quantities*) allows us to solve problems of quantum mechanics using the theory of integers. One of the central problems of physics is the problem of radiation from a hydrogen-like atom. The solution to this problem using the commensurability hypothesis is described in great detail in [3], but in this article we will

reproduce its presentation for the integrity of the perception of the proposed text.

2. Solution of the problem of radiation of a hydrogen-like atom

For a substantiation of a possibility and necessity to use discrete methods of description of the physical reality, we will calculate spectral series of hydrogen atom, using the principle of commensurability. Let it be the simplest mechanical atomic model, namely, as a proton with the localised electron rotating around. In process of radiation of atom three physical objects are involved: the proton, the electron, and a the quantum.

Let the initial atom state will be an excited one, being as much as close to the ionized state. Conservation laws of energy-momentum we will with necessity write in the relativistic form. We will transfer in the coordinate system related to the excited atom. Its energy will be noted in the form:

$$E_{at}^2 = (m_0 + m_{eff})^2 c^4 \quad (1)$$

Here $m_0 c^2$ is energy of atom in the basic, non-excited state, $m_{eff} c^2$ is a virtual value of excitation energy of atom, as much as close to ionisation energy E_{ion} , c is velocity of light.

After irradiation of the quantum having energy E_q , the excited atom obtains an momentum \mathbf{p}_{at} , which is equal on quantity and opposite in the direction to a quantum momentum \mathbf{p}_q :

$$p_{at}^2 = p_q^2 = E_q^2 / c^2 \quad (2)$$

After irradiation of quantum by atom, we will denote energy of atom as:

$$E'_{at}{}^2 = (m_0 + m'_{eff})^2 c^4 + p_{at}^2 c^2, \quad (3)$$

here $m'_{eff} c^2$ is a virtual value of excitation energy of atom in lower energy state (i.e., after quantum irradiation), $p_{at}^2 c^2$ - energy of atom motion after quantum irradiation.

Let us determine energy of the radiated quantum (it is a difference of energies of an excited atom before radiation of quantum and after its radiation) as:

$$p_q c = E_{at} - E'_{at} = (m_0 + m_{eff}) c^2 - \sqrt{(m_0 + m'_{eff})^2 c^4 + p_{at}^2 c^2} \quad (4)$$

Let us rewrite this expression:

$$\sqrt{(m_0 + m'_{eff})^2 c^4 + p_{at}^2 c^2} = (m_0 + m_{eff}) c^2 - p_q c$$

Let us raise it in the second degree, remove the brackets, reduce and group like terms:

$$(m_{eff}^2 - m'_{eff}{}^2) c^4 + 2m_0(m_{eff} - m'_{eff}) c^4 = 2E_q(m_0 + m_{eff}) c^2 \quad (5)$$

From here

$$E_q = \frac{\left\{ m_{eff}^2 \left[1 - \left(\frac{m'_{eff}}{m_{eff}} \right)^2 \right] c^2 \right\}}{2(m_0 + m_{eff})} + \frac{\left[m_0 m_{eff} \left(1 - \frac{m'_{eff}}{m_{eff}} \right) c^2 \right]}{m_0 + m_{eff}} \quad (6)$$

Considering that $m_{eff} \ll m_0$, it is possible to write with high accuracy:

$$E_q = \left(\frac{m_{eff}}{2m_0} \right) \cdot m_{eff} c^2 \left[1 - \left(\frac{m'_{eff}}{m_{eff}} \right)^2 \right] + m_{eff} c^2 \left[1 - \frac{m'_{eff}}{m_{eff}} \right] \quad (7)$$

If to neglect a term of the order of $m_{eff}/2m_0$ in last equality, for energy of the radiated quantum we will finally obtain:

$$E_q \approx m_{eff} c^2 \left[1 - \frac{m'_{eff} c^2}{m_{eff} c^2} \right] = E_{ion} (1 - m'_{eff} c^2 / m_{eff} c^2) \quad (8)$$

From the last relation it is seen that if all values of energy of irradiated quanta E_q have a common measure with the same initial energy of the excited atom E_{ion} (they must have it by definition), then ratio $m'_{eff} c^2 / m_{eff} c^2$ should be rational and among a plurality of rational ratios, certainly, will be also numbers 1/4, 1/9, 1/16 etc., that will correspond to energy of quanta of Lyman series:

$$E_{q1} = E_{ion} (1 - 1/4), E_{q2} = E_{ion} (1 - 1/9), \text{ etc.}$$

If to take (let it is now formal) other admissible rational numbers, for example, 31/36, then, having substituted it in expression (9), we will obtain:

$$E'_{q1} = E_{ion} \left(1 - \frac{31}{36} \right) = E_{ion} \cdot \frac{5}{36} = E_{ion} \left(\frac{1}{4} - \frac{1}{9} \right) \quad (9)$$

Further, the rational number 13/16 is also admissible, substituting it in (9), we will obtain:

$$E'_{q2} = E_{ion} \left(1 - \frac{13}{16} \right) = E_{ion} \cdot \frac{3}{16} = E_{ion} \left(\frac{1}{4} - \frac{1}{16} \right) \quad (10)$$

Accordingly, the number 79/100 will give the energy of the quantum:

$$E'_{q3} = E_{ion} \left(1 - \frac{79}{100} \right) = E_{ion} \cdot \frac{21}{100} = E_{ion} \left(\frac{1}{4} - \frac{1}{25} \right), \text{ etc.} \quad (11)$$

It is seen that energy of quanta E'_{q1} , E'_{q2} , E'_{q3} give the Balmer series. It is clear that remaining spectral series can be simply obtained using such formal method.

However, it is also seen that among plurality of admissible rational values of ratios $m'_{eff} c^2 / m_{eff} c^2$ for description of corresponding series, only specific values are suitable, i.e., there are some selection rules of the "necessary" values of the rational ratios, which correspond to experiment. It has appeared that for an explanation of the fact of the selection of the "necessary" values one should use requirements of commensurability in the act of irradiation of the excited atom not only for energies and momenta, but also for the third conserved quantity – an angular momentum of the atomic system.

Let us still use the simplest mechanical atomic model, where the localised electron rotates round the

proton on a certain orbit and possesses a certain angular momentum:

$$J = r_{el} \times p_{el} \tag{12}$$

Here, r_{el} is a radius of electron rotation on the orbit, p_{el} is the momentum of an atomic electron.

Values of the angular momentum of the electron in atom *before and after irradiation* of quantum by the atom should remain commensurable *by definition*. But, if the momentum of the atomic electron p_{el} is expressed by an integer of a unit of measure, hence, for integrality of J , the radius r_{el} should also be expressed by an integer, (or rational, that is the same) but, certainly, of its own units of measure. In other words, *values of radii of rotation of the electron in atom must be commensurable with some least value $r_{el,min}$* . Using below the mechanical atomic model, we will determine these integral-valued, i.e. allowed, values of radii of rotation of the electron. On each of orbits a centrifugal and centripetal forces should be counterpoised:

$$F_{eff} = m_{el}V_{el}^2/r_{el} \tag{13}$$

where V_{el} is velocity of the electron on the orbit, m_{el} is electron mass:

$$F_{ctf} = -e_1 \cdot e_2/r_{el}^2 \tag{14}$$

where e_1 and e_2 are elementary charges of the electron and proton respectively, i.e.:

$$\frac{m_{el}V_{el}^2}{r_{el}} = -\frac{e_1 \cdot e_2}{r_{el}^2} \tag{15}$$

This relation can be also written as:

$$m_{el}V_{el}^2 \cdot \frac{r_{el}}{r_{el}^2} = -\frac{e_1 \cdot e_2}{r_{el}^2} \tag{16}$$

$$\text{or } m_{el}V_{el}^2 \cdot r_{el} = -e_1 \cdot e_2 \tag{17}$$

From the last relation it is seen that for any integer r_{el} the product $m_{el}V_{el}^2 \cdot r_{el}$ *should remain constant*, as product e_1e_2 in right member of the equality is constant. But, besides, for any r_{el} the requirement of commensurability for values J and J' , where J' is the value of the moment after irradiation, should be satisfied. To satisfy *simultaneously* requirements of constancy of $m_{el}V_{el}^2 \cdot r_{el}$ and the requirement of commensurability of the moments, r_{el} must vary on *the whole quadrate* of unities, i.e. it should be equal to 1, 4, 9, 16, ... etc. units of measure. Really, if r_{el} has varied not on the whole quadrate of units of measure, and, for example, it increased in two times then for invariance of $m_{el}V_{el}^2 \cdot r_{el}$ in (17) velocity of electron V_{el} should decrease accordingly in $\sqrt{2}$ times. Then quantity of the momentum after irradiation should become:

$$J' = m_{el} \cdot \left(\frac{V_{el}}{\sqrt{2}}\right) \cdot 2r_{el} \tag{18}$$

But as before irradiation it was:

$$J = m_{el}V_{el}r_{el} \tag{19}$$

Then ratio J/J' becomes *in this case* be irrational, and it is *intolerable* in the proposed model, as in this case the momentums have no common measure.

If the atom potential energy is described by U/r function, an allowed values of r_{el} , varying on the whole quadrate of units of measure $r_{el,min}$ (they ensure commensurability of values of the moments of momentums) determine allowed values of the potential energy, namely, U_{max} , $U_{max}/4$, $U_{max}/9$, ... etc., where $U_{max} = E_{ion}$.

Radiation of the exited atomic system can be carried out only at the expense of decrease of its intrinsic energy. So, transition of the atomic system from one higher value of the potential energy in a lower one is accompanied by quantum irradiation, for example:

$$E_{q1} = \left(U_{max} - \frac{U_{max}}{4}\right) = E_{ion} \left(1 - \frac{1}{4}\right); E_{q2} = \left(U_{max} - \frac{U_{max}}{9}\right) = E_{ion} \left(1 - \frac{1}{9}\right); \dots \text{ etc.} - \text{ we have spectral Lyman series.}$$

Balmer series will be obtained from transitions between $U_{max}/4$ and remaining, lower energy states:

$$E_{q1} = \left(\frac{U_{max}}{4} - \frac{U_{max}}{9}\right) = E_{ion} \left(\frac{1}{4} - \frac{1}{9}\right); E_{q2} = \left(\frac{U_{max}}{4} - \frac{U_{max}}{16}\right) = E_{ion} \left(\frac{1}{4} - \frac{1}{16}\right), \text{ etc.}$$

Remaining series are obtained in the same manner.

Thus, regularities of transitions of hydrogen-like atomic systems from one excited state into another with quantum irradiation (or absorption), observed experimentally, can be explained by the necessity of performance of requirements of commensurability of energies, momentums, and the moments of momentums of these systems.

The result obtained is interpreted from the point of view of physics as follows. When interacting physical objects, quantities that are *absolutely* preserved cannot be transferred from one object to another with an accuracy of one or another sign (for example, if the value of a quantity is irrational, then with an accuracy of up to the tenth or hundredth decimal place, etc.), they must be conveyed by *the exact value* of the units of this quantity, because the conserved quantity does not disappear anywhere and does not appear from nothing. And such an accurate transfer of the quantity of a conserved quantity from one object to another can be performed only when the value of any conserved quantity will have a common measure *before and after the interaction* for all participants in the interaction - only such interactions *are resolved*.

In the above problem, it was not taken into account that the electron has its own mechanical and magnetic moments of momentums. Since both the mechanical and magnetic moments of an electron are conserved quantities, then, of course, in a scrupulous solution of such a problem, their values must also be taken into account. But this is a deeper solution to the problem of atomic radiation. It should be noted that *the principle of commensurability of conserved quantities* is universal, it allows solving many other problems. For example, in [3] a numerical solution of another classical problem of physics, the scattering problem, was also given, and *quantization over the scattering angles was obtained*, which is especially noticeable for large deviations of

the test particle, but it is important that such a solution was obtained under the assumption of the interaction of a *localized particle* with a force center (and not in the wave approximation of the particle-wave with *one* wavelength, which is determined by de Broglie's law).

When solving problems in physics using the theory of integers, it is extremely important to determine in each problem *what is the measure* of a conserved quantity, i.e. how to determine the magnitude of the measure, with what "meter" to measure this or that conserved quantity when describing the interaction, in order to obtain *an integer number* of units of measure. Some aspects of this complex problem are described in [4]. The solution of another applied problem on the physical foundations of polymorphic transformations in crystals using the concepts of the commensurability of conserved quantities is given in [5]. Philosophical aspects that arise when using the methods of the theory of integers in physics are discussed in [6].

3. Conclusion

The application of *the principle of commensurability of conserved quantities* in physics provides a physical justification for the Bohr quantization hypothesis, which underlies quantum mechanics. It can be argued in a sense that the principle of causality is returning to quantum physics, because there is a completely clear physical reason for explaining the "resolved" and "unresolved" states of quantum systems. So far, such states have been explained simply by the mathematical results of solving problems that were confirmed by experiment, without a physical explanation of *why* these solutions are true. But, in our opinion, the greatest dissatisfaction of both physicists and philosophers should be caused by the fact that in order to explain the experimentally confirmed diffraction pattern of the scattering of localized particles on a crystal lattice, one has to use the model of a *localized particle-wave with one value of the wave vector*, while the localized entity *must be presented* as a packet of waves. But the packet will inevitably spread out, about which M. Born writes very clearly and fairly in [2]: "...*there is a great temptation to try to interpret a material particle as a wave packet formed by the superposition of a certain group of waves. However, this tempting interpretation runs into insurmountable difficulties, because such a wave packet, generally speaking, is unstable and will spread out very soon*". It turns out that, on the one hand, a localized entity must be represented as a packet of waves,

but on the other hand, in order to explain the results of the experiment on the diffraction of *localized particles*, we are forced to represent this localized entity as a *single wave*, which has an infinite size in the direction perpendicular to the propagation vector. This is indeed an "insurmountable difficulty" both in physics and in philosophy, but it can be overcome using *the principle of commensurability of conserved quantities*.

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Astana, Republic of Kazakhstan*[DOI: 10.5281/zenodo.7747279](https://doi.org/10.5281/zenodo.7747279)**МИКРОТРЕЩИНЫ В ВЫСОКОЭНТРОПИЙНЫХ СПЛАВАХ CrNiTiZrCu****Бердибеков А.Т.***PhD, ассоциированный профессор,
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The article investigates the high-entropy alloy (HEA) CrNiTiZrCu. Here we turn our attention to primary cracks in HEAs, which are not fully explored even in pure metals. To obtain an alloy, micropowders of the corresponding metals were taken and mixed in equiatomic proportions. This composition was placed in a vacuum thermal furnace and sintered in it for 3 hours. The length of the primary nanocracks turned out to be $L_{nm} = 1.1$ nm, i.e., it is a nanostructure, and the length of the mesocrack is $L_{\mu m} = 0.1$ μ m. A feature of the CrNiTiZrCu alloy is their self-organization during the formation of a high-entropy alloy - a cellular (pencil) structure. In the experiment, we use equal-channel angular pressing, which provides multiple (repeated) shear deformation without changing the cross section of the samples. Upon repeated deformation, the mesocrack in the alloy begins to grow until the moment when the process of its destruction begins. The length of the main mesocrack increased from 0.1 μ m to 50 μ m. The main disadvantages of HEAs made of refractory elements are high density and brittleness.

Аннотация

В статье исследован высокоэнтропийный сплав (ВЭС) CrNiTiZrCu. Здесь мы обратим внимание на первичных трещинах в ВЭС, которые не вполне исследованы даже в чистых металлах. Для получения сплава брались микропорошки соответствующих металлов и смешивались в эквиатомных пропорциях. Этот состав помещался в вакуумную термopечь и спекался в ней в течение 3 часов. Длина первичных нанотрещин оказалась равной $L_{nm} = 1.1$ нм, то есть представляет собой наноструктуру, а длина мезотрещины равна $L_{\mu m} = 0.1$ мкм. Особенностью сплава CrNiTiZrCu является их самоорганизация в процессе формирования высокоэнтропийного сплава – ячеистая (карандашная) структура. В эксперименте мы используем равноканальное угловое прессование, которое обеспечивает многократную (повторную) деформацию сдвигом без изменения поперечного сечения образцов. При повторной деформации мезотрещина в сплаве начинает расти до того момента, когда начнет процесс его разрушения. Длина магистральной мезотрещины увеличилась с 0.1 мкм до 50 мкм. Основными недостатками ВЭС из тугоплавких элементов являются высокая плотность и хрупкость.

Keywords: high-entropy alloy, metal, nanocrack, mesocrack, density, brittleness, deformation, fracture.

Ключевые слова: высокоэнтропийный сплав, металл, нанотрещина, мезотрещина, плотность, хрупкость, деформация, разрушение.

Введение

Высокоэнтропийные сплавы (ВЭС) начали исследовать 20 лет тому назад. Первый Патент по ВЭС был получен J.-W. Yeh в 2002 году [1]. ВЭС содержат не менее пяти элементов, причём количество каждого из них не должно превышать 35 ат. % и не должно быть меньше 5 ат. %. Для таких сплавов характерны повышенные, по сравнению с традиционными многокомпонентными сплавами, значения энтропии смешения S_{mix} . Классическими примерами ВЭСов являются многокомпонентные сплавы, в которых элементы находятся в равной атомной доле. ВЭС выделены в особую группу, так как процессы структуро- и фазообразования в них, а также диффузионная подвижность атомов, механизм формирования механических свойств и термическая стабильность существенно отличаются от аналогичных процессов в традиционных сплавах. К последним относятся сплавы, в которых есть базовые элементы (Fe, Ni, Mo, Al и др.), определяющие кристаллическую решетку материала. Фазовый состав таких сплавов легко прогнозировать исходя из двойных или тройных диаграмм состояния, а введение легирующих добавок приводит либо к упрочнению исходной решетки, либо к выделению в ней дисперсных фаз.

Обстоятельные обзоры по ВЭС за последние годы представлены в работах [2, 3].

В настоящей статье мы обратим внимание на первичных трещинах в ВЭС, которые не вполне исследованы даже в чистых металлах. Рентгеновскими и электронно-микроскопическими методами микротрещины были обнаружены в металлах типа Al, Ni, Pt, Au, Ag, Cu, Mo и др. Размер этих микротрещин оказался равным доли микрон или не-

сколько микрон [4, 5]. Теоретически длина нанотрещин определялась в работах [6, 7, 8]. В этих работах использовались модели, основанные на механике деформируемого конденсированного состояния и физики твердого тела. В основном использовались поликристаллические кристаллы кремния и карбида кремния. В моделях размер нанотрещин получен в интервале $0 < L < 2$ нм (ниже мы увидим подобные величины).

Однако, сравнительно недавно нанотрещины были обнаружены при разрушении минералов типа кварцитов [9, 10]. Этот метод основан на фрактолюминесценции, когда в процессе разрушения твердого тела возникает сигнал света (люминесценция) при разрыве атомных связей на поверхности нанотрещин с временным разрешением от 1 до 2 наносекунд.

Мы за длину трещин в твердых телах взяли их толщину поверхностного слоя, которая составляет для обычных металлов 1-4 нм [11, 12]. На этом мы и остановимся.

Объекты и методы исследования.

Для приготовления мишени CrNiTiZrCu брались микропорошки соответствующих металлов и смешивались в эквиатомных пропорциях (рис. 1а). Затем приготовленная смесь порошков помещалась в мелющий стакан планетарной шаровой мельницы, изготовленный из карбида вольфрама и добавлялись мелющие тела (шары диаметром (5-10) мм) также изготовленные из карбида вольфрама, масса которых была равна 10 массам смеси порошков. После стакан наполняли бензином «Галоша», плотно закрывали крышку и включали планетарную шаровую мельницу (скорость вращения составляла 500 об/мин, время работы 5 часов) (рис. 1б).



Рисунок 1. Микропорошки соответствующих металлов (а); планетарная шаровая мельница (б).



Рисунок 2. Двухколпачковая вакуумная печь (а), графитовая форма для плавки металла (б), вид мишеней CrNiTiZrCu, полученных методом вакуумной плавки (в).

Полученный гомогенизированный состав затем сушился в вакууме и при помощи прессформы прессовался в плоский диск диаметром 100 мм и толщиной 5 мм (рис. 2б). Далее диск помещался в вакуумную термопечь и спекался в ней в течение 3 часов (рис. 2а). Таким образом, изготовленная мишень CrNiTiZrCu (рис. 2в) использовалась для

дальнейшего магнетронного нанесения покрытий на установке ННВ 6.

На рисунке 3а показан срез сплава CrNiTiZrCu, используя систему Quanta 200 3D. Отчетливо видна карандашная структура (рис. 3б).

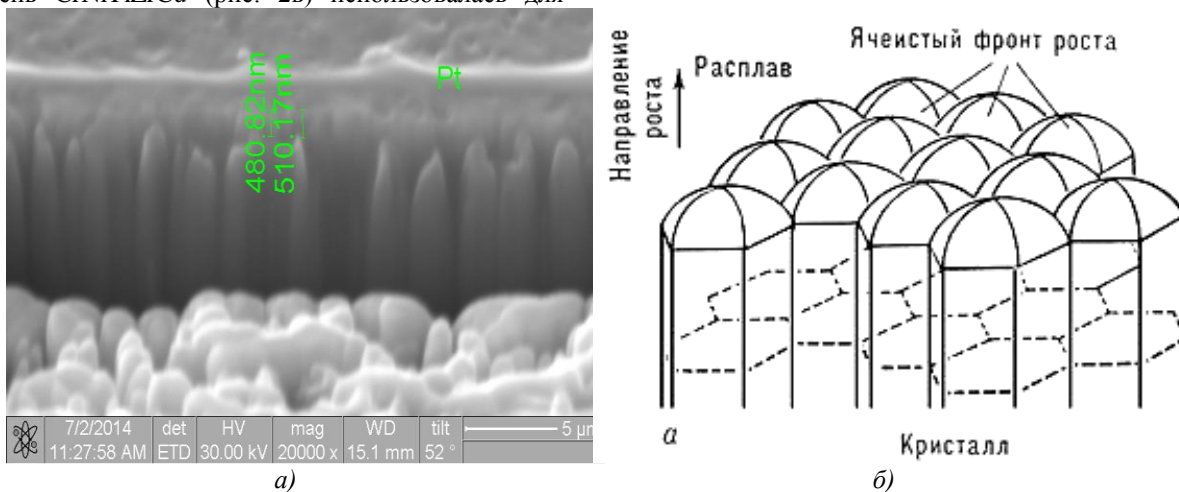


Рисунок 3. Срез сплава CrNiTiZrCu (а); ячеистая (карандашная) структура (б) [13].

На рисунке 4 представлено изображение ячеистой структуры сплава CrNiTiZrCu, снятое сверху растровым электронным микроскопом Tescan Vega

LSU. Здесь же показано изображение сплава CoCrCuFeNi [14].

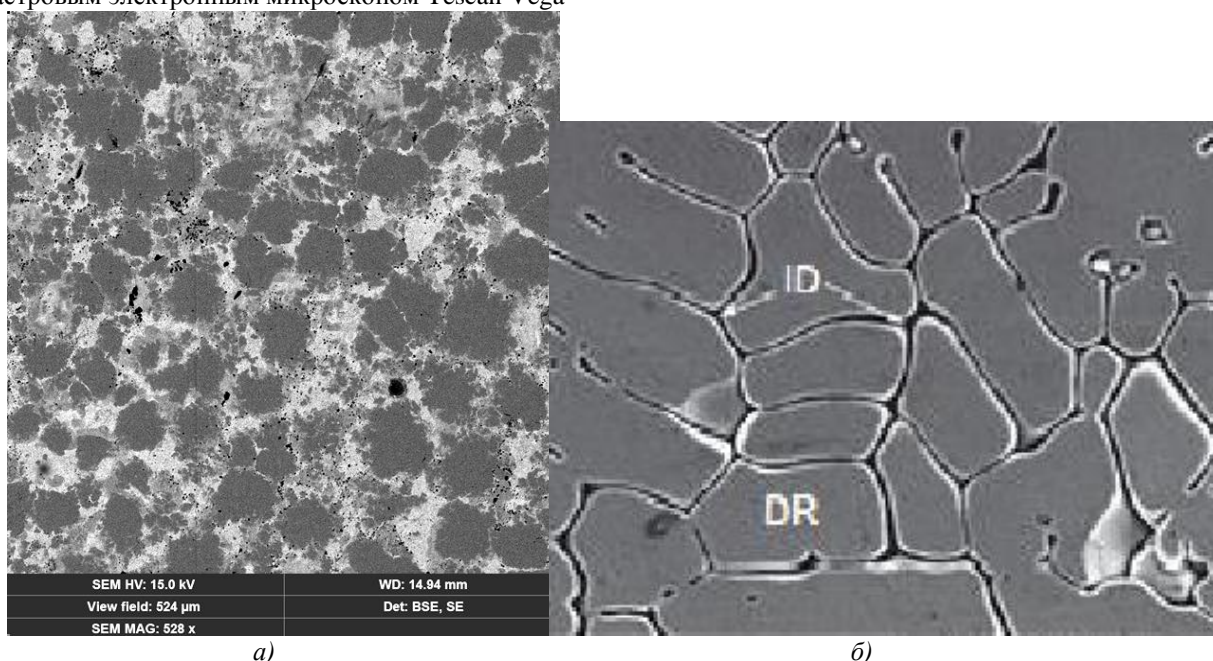


Рисунок 4. Изображения сплавов CrNiTiZrCu и CoCrCuFeNi [14].

На рисунке 5а показан РФЭС спектр сплава CrNiTiZrCu, измеренный на растровом электронном микроскопе JEOL JSM-5910, а на рисунке 5б

представлен спектр дифракции, измеренный на рентгеновском дифрактометре XRD-6000.

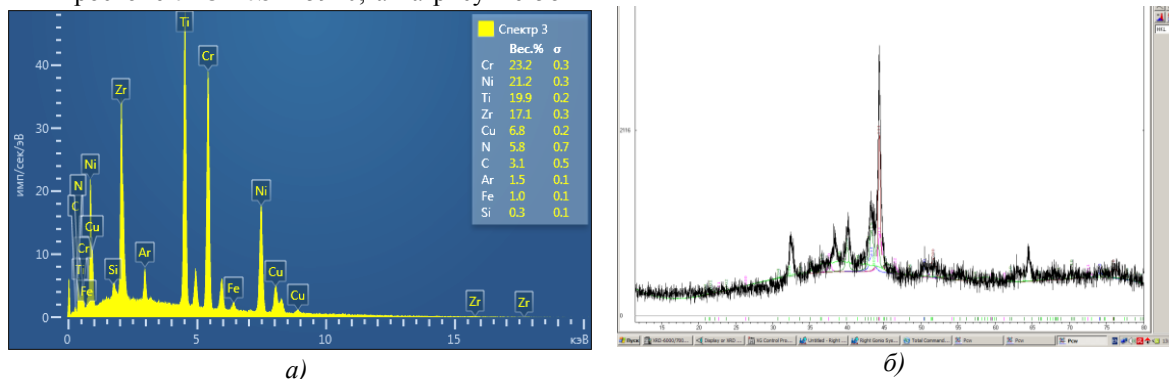


Рисунок 5. РФЭС (а) и спектр дифракции (б) сплава CrNiTiZrCu

Таблица 1.

Количественный химический состав CrNiTiZrCu, ат. %					
Элемент	Cr	Ni	Ti	Zr	Cu
Номинальный	20	20	20	20	20
в аргоне	23,2	21,2	19,9	17,1	6,8
в азоте	22,8	20,8	19,7	16,9	7,0

Результаты и их обсуждение.

Длина нанотрещины дается эмпирической формулой [11, 12]:

$$L_{nm} = 0,17 \cdot 10^{-9} \nu \quad (1)$$

В уравнении (1) нужно знать один параметр – молярный объем элемента металла или соединения, который равен $\nu = M/\rho$ (M – молярная масса, ρ – ее плотность).

Для элементов с высокой энтропией справедливы следующие соотношения:

$$T_m = \sum_{i=1}^n c_i (T_m)_i, \quad M = \sum_{i=1}^n c_i (M)_i, \quad \rho = \sum_{i=1}^n c_i (\rho)_i, \quad \dot{A} = \sum_{i=1}^n c_i (E_i). \quad (2)$$

где $(T_m)_i$ – температура плавления каждого элемента сплава (К), $(M)_i$ – молярная масса каждого элемента сплава (г/моль), ρ – плотность каждого элемента сплава (г/см³), E – модуль Юнга (ГПа), c_i

– концентрация каждого элемента сплава, n – число элементов сплава.

На основании табл. 1 и формулы 2 имеем:

Таблица 2.

Параметры сплава CrNiTiZrCu

Сплав	M, г/моль	ρ , г/моль	$L_{nm}=R(I)$, нм	$L_{\mu m}$, нм	E, ГПа
CrNiTiZrCu	46.0	7.3	1.10	110	166

По Гриффитсу предельная скорость распространения трещины равна [15]:

$$V_c = \beta \cdot V_0 \cdot (1 - \gamma_1 / W_a)^{1/2} \quad (3)$$

и составляет около 1/3 скорости звука V_0 в материале.

Для железа по формуле (1) длина нанотрещины при 2 наносекунд $L_{nm} = 1.2$ нм, а длина микротрещины, измеренная электронно-микроскопическим методом, $L_{\mu m} = 0,2$ мкм [5], тогда $L_{\mu m} / L_{nm} = 0.2 \cdot 10^{-6} / 1.2 \cdot 10^{-9} = 1.7 \cdot 10^2$, а скорость звука у железа $V_{Fe} = 5120$ м/с и $1/3 V_{Fe} = 1,7 \cdot 10^2$. Оба значения совпадают. Это значит, чтобы получить длину мезотрещин сплава CrNiTiZrCu (и любых твердых

тел) в стационарном режиме без приложенного внешнего напряжения необходимо значения для L_{nm} умножить на 100 (таблица 1, $L_{\mu m}$).

Особенностью сплава CrNiTiZrCu (смотри рис. 3 и 4) является их самоорганизация в процессе формирования высокоэнтропийного сплава – ячеистая (карандашная) структура. Для решения вопроса о самоорганизации структурных единиц сплава рассмотрим модель ячеек Бенара (1900 год). Ячейки Бенара – это возникновение упорядоченности в виде конвективных ячеек в форме цилиндрических валов или правильных шестигранных фигур в слое вязкой жидкости с вертикальным градиентом температуры (рис. 6) [16].

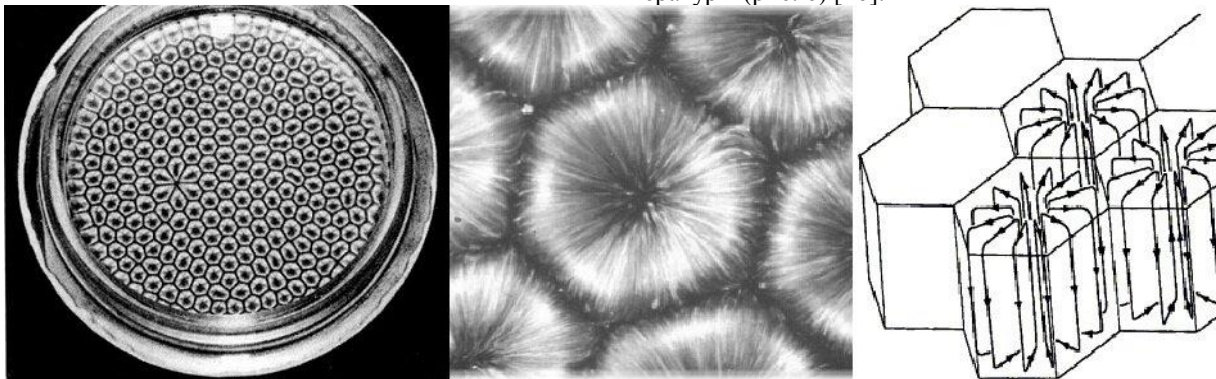


Рисунок 6. - Ячейки Бенара [16].

На этом рисунке справа эти ячейки похожи на карандаши рис. 3б. Управляющим параметром самоорганизации служит градиент температуры. Вследствие подогрева в первоначально однородном слое жидкости начинается диффузия из-за возникшей неоднородности плотности. При преодолении некоторого критического значения градиента, диффузия не успевает привести к однородному распределению температуры по объему. Возникают цилиндрические валы, вращающиеся навстречу друг другу (как сцепленные шестеренки). При увеличении градиента температуры возникает второй критический переход. Для ускорения диффузии каждый вал распадается на два вала меньшего размера. При дальнейшем увеличении управляющего параметра валы дробятся, и в пределе возникает турбулентный хаос. Более строго при анализе процессов в системе Бенара в качестве управляющего параметра выбирается число Рэлея: $Re = gL^3 b d T / \nu a$, где g – ускорение свободного падения, L – характерный размер,

b – коэффициент объемного расширения, dT – градиент температуры, ν – кинематическая вязкость, a – коэффициент температуропроводности среды. Поскольку кинематическая вязкость $\nu \sim 1/\sigma$, σ – поверхностное натяжение, то из приведенного выше выражения для числа Рэлея следует, что управляющим параметром в нашем случае (a возможно и в случае процесса Бэнара) является поверхностное натяжение. Тем самым мы возвращаемся к вопросу, обсуждавшему нами в работах [17, 18]. В природе также встречаются образования, похожие на ячейки Бенара (рис. 7). На этом фото показаны вертикально стоящие базальтовые столбы в форме плотно прилегающих друг к другу правильных призм, чаще всего шестигранных. Они соответствуют карандашам на 3б. По поводу базальтов в работе [19] сделали предположение, что справедлива контракционно-конвективная модель возникновения столбчатой отдельности, согласно которой в слое жидкой излившейся лавы по мере ее остывания создаются условия для конвекции Рэлея - Бенара.



Рисунок 7. - Столбчатые базальты на северном побережье Ирландии.

Обратимся теперь к механическим свойствам сплава CrNiTiZrCu как экспериментальных, так и теоретических. В эксперименте мы используем равноканальное угловое прессование, которое обеспечивает многократную (повторную) деформацию сдвигом без изменения поперечного сечения образцов. При повторной деформации мезотрещина в сплаве начинает расти до того момента, когда начнет процесс его разрушения. От зарождения первичной трещины это выглядит, как показано на рис. 8.

Из рисунка 8 следует, что диаграмма разрушения представляет S-образную кривую, характерную для кривой из теории катастроф [20]. Чтобы описать S-образную кривую нужно рассмотреть три

объекта: 1) цель функционирования; 2) две координаты процесса; 3) управляющие параметры. В нашем рассмотрении цель функционирования - разрушение сплава, а координатой процесса разрушения возьмем скорость движения трещины $L_{\text{ум}}$, обусловленной образованием N элементарных очагов разрушения, пропорциональном числу трещин. В качестве управляющих параметров возьмем плотность ρ и $E/F(I)$, где E - модуль Юнга и $F(I)$ - барьер Пайерлса-Набарро сплава. Для одной координаты $L(N)$ и двух управляющих параметров в теории катастроф имеется только одна каноническая зависимость для записи зависимости функции цели [21]:

$$L(N) = 0.25N^4 - 0.5\rho N^2 - E/F(I) \cdot N. \quad (4)$$

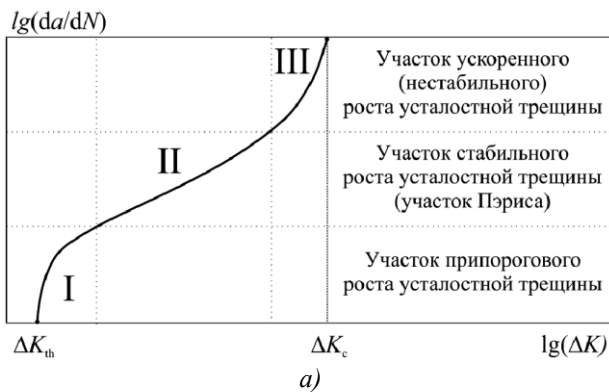


Рисунок 8. Кинетическая диаграмма усталостного разрушения (а) [8]; сплав CrNiTiZrCu перед разрушением (б).

Катастрофа, имеющая такую потенциальную функцию $L(N)$, называется катастрофой типа «сборки» Уитни [21]. Уравнение (4) задает статическую модель разрушения сплава. Для получения динамической модели будем считать трещину градиентной системой. Это означает, что потенциальная функция $L(N)$ стремится к экстремуму. Градиент функции $L(N)$ равен:

$$\frac{dL(N)}{dt} = \frac{\partial L(N)}{\partial N} = N^3 - \rho N - E/F(I) = 0. \quad (5)$$

В механике такое уравнение характерно для движения в среде вязкого трения (внутреннее трение в сплаве). В этом случае процесс перехода из

одного состояния в другое получается плавным, похожим на S-образную кривую (рис. 8а). Расчет уравнения (5) по формуле Кардана дал для числа трещин в сплаве $N \approx 1.2 \cdot 10^7$. Длина магистральной мезотрещины увеличилась с 0.1 мкм до 50 мм (рис. 8б).

Заключение

В настоящем сообщении мы затронули вопрос о работоспособности высокоэнтропийных сплавов и их практическом применении в качестве функциональных покрытий на разнообразные детали. Основными недостатками ВЭС из тугоплавких элементов являются высокая плотность и хрупкость. При этом добиться низкой плотности, как, напри-

мер, у алюминия, невозможно по причине используемых в композиции сплава элементов с уже высокой плотностью.

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POLITICAL SCIENCES

AUTHORITARIAN LOGIC AND HYBRID WARFARE: UNDERSTANDING SERBIA'S APPROACH TO KOSOVA

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Doctor

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Abstract

This paper examines the impact of authoritarianism on the dynamics of hybrid warfare in the context of Serbia's policy towards Kosova. Using a research approach that draws on this theme, the paper explores how the logic of authoritarianism undermines the foundations of the liberal order, as evidenced by the political reality of countries like Hungary. In addition, traditional authoritarian states like Serbia have embraced hybrid warfare as a continuation of special warfare against neighboring states, leading to new elements of hybrid warfare that pose a major threat to Kosova.

The primary objective of this essay is to provide a nuanced analysis of the authoritarian logic of Serbian chauvinism towards Albanians. The paper specifically examines the rejection of complexity and the claim of an inversion of historical reality. It also delves into the mindset of the Serbian elite and their farcical logic for territorial expansion. Furthermore, the essay highlights the influence of media and social networks in shaping the dynamics of extreme groups seeking to engage in hybrid activities against Kosova. These dynamics have led to the dehumanization of the school system in Serbia with regards to the Albanians.

Through a comprehensive analysis of the impact of authoritarianism on the logic of hybrid warfare, the paper makes a crucial contribution to understanding contemporary conflict dynamics and the role of non-traditional forms of warfare in shaping state behavior. The paper's findings have important implications for the wider debate on authoritarianism and hybrid warfare, suggesting the need for further research in this area. This paper aims to contribute to the development of more effective strategies to counter the authoritarian logic of hybrid warfare and to promote a more stable and peaceful international order.

Keywords: Authoritarianism, Hybrid warfare, Kosova-Serbia relations, Non-traditional forms of warfare, Media influence.

Introduction

Serbian authoritarianism can be defined as a political system characterized by the concentration of power in the hands of a single leader or group, which uses various forms of coercion and repression to maintain control over the state and society (Petrović, 2014). This type of political system is often associated with suppression of political opposition, limited civil liberties, and the use of force to maintain power.

Throughout the 19th and 20th centuries, and even today, Albanians have been viewed as the "main enemy" of Serbia in Serbian doctrines on security and national interests. This belief, or prejudice, has been embedded in the consciousness of eight to nine generations of Serbs, leading to a complex of self-underestimation and inferiority. This is due, in part, to the fact that Albanians were the first to accept Roman Catholic Christianity among the peoples of Europe and are proud of their history and status as autochthonous people in the region (Thaçi, 2016; Garton Ash, 2017).

Since 1945, democracy has faced its deepest crisis, with a triple crisis in our de facto society: economic (with emphasis on energy), ecological, and political. This raises the question of whether the established political level and governing format in modern Western society can provide hope for the future of democracy, especially given the global shock suffered by the capitalist order in the first two decades of the 21st century. While there are more democratic countries on a planetary level than ever before, counter-revolutions with an

anti-liberal character are appearing on all sides (Levitsky & Ziblatt, 2018; Menasse, 2019). This phenomenon is of deep concern to American political scientists Steven Levitsky and Daniel Ziblatt, who warn that democracy is in danger on the world level, even in places where it was once considered self-evident.

In light of these concerns, Austrian writer Robert Menasse cautions that if we do not emerge from this crisis, which threatens the development of democracy, we will be left with ruins. The threat of hybrid war, or the deepening of the crisis of democracy, has become a real threat to democratic societies and a political challenge (Redžepi, 2022). Serbia's hybrid war against Kosova, combined with geopolitical positioning, is undermining the ability of the EU and Western democracies to make historic decisions. Serbia's permanent hybrid threats to the new democracy in the Republic of Kosova have created a significant dose of fear and anxiety among the population of the Serbian minority in the north of Kosova, who are also under pressure for obedience and submission to Belgrade's power in Kosova. This threat of the nature of hybrid war has also affected other layers of Kosovar society, extending its influence to the judicial and legislative system (Vlahović, 2022).

The session of the Serbian Assembly on February 2, 2023, where the president of Serbia and opposition politicians spoke, demonstrated that Serbian political parties, with few exceptions, as well as populist politicians who dominate the Serbian Parliament, are pushing against liberal democratic norms and values. They

also do not hide their hatred towards the Albanian people. For example, the Serbian president blamed the opposition for releasing the current Prime Minister of Kosovo, Albin Kurti, and 1,600 other hostages from prison in 2001, when he was in power.

These dominant forces in the Serbian political scene have turned into vectors of foreign intervention (Vlahović, 2022).

This essay will shed light on the interaction between the logic of the Serbian mentality, the Serbian Church as an instrument of political power, and authoritarianism in the political sphere. These are powerful weapons in the development of the hybrid war against Kosovo.

Research question: What is the impact of authoritarianism on the dynamics of hybrid warfare in the context of Serbia's policy towards Kosovo?

Hypothesis: The logic of authoritarianism undermines the foundations of the liberal order and contributes to the adoption of hybrid war as a continuation of special war against neighboring states. This results in new elements of hybrid war that present a real threat to Kosovo.

Dependent variable: Instability in the Western Balkans resulting from Serbia's policy towards Kosovo, which is influenced by authoritarianism and hybrid warfare.

Definition of authoritarianism

In the Oxford political dictionary, authoritarianism is defined as "a form of government in which the rulers demand blind obedience from the ruled". The Serbian princes, including the current one - Aleksandar Vučić, not by chance had Frederik the Great as their model. He is quoted as having said that "I have an agreement with my people: they can say what they want and I can do what I want".

In this context, it is aligned with despotism. (Heywood, 2013)

Defining authoritarianism remains a complicated exercise, especially given its normative charge. If "populism embodies and exploits a series of real concerns and demands to improve democratic conditions", authoritarianism itself excludes any form of democracy. If "the essential belief of populism is that a direct representation of the people will bring better governance because it will bypass other forms of decision-making", the belief of authoritarians is quite the opposite. (Mouffe, 2018)

For Rosanvallo (2018), populism is a pathology of democracy, since it exploits the necessarily imperfect nature of electoral representation, authoritarianism does not care at all about democracy and electoral representation.

The term authoritarianism is used in both political science and social psychology. Political scientists explain it as a dictatorial form of rule that, unlike dictatorial totalitarianism, often allows for a certain degree of pluralism. The most important feature of authoritarian forms of government is the absence of underlying ideologies; instead, the bearers of authoritarianism are based on so-called eternal values and traditional cus-

toms. Better than anywhere and anytime, this phenomenon is embodied in the personality of the current Serbian president - Aleksandar Vučić. (Lazić, 2020)

Antonio Scurati (2018), in his historical work on the rise of Italian Fascism, suggested that Benito Mussolini should be considered "an empty man", but able to quickly acquire the skills of a fascist leader who would be able to manipulate the masses of the people to create confidence in the advantages of fascist power.

The current Serbian leader - authoritarian to the core, demonstrates everywhere and whenever a similar, tactical attitude to make his narrative believable to the people. The qualification of the Albanians as the greatest enemy of the Serbian people even today in the age of digitization and the coming artificial intelligence, coincides with the complete premeditated compatibility of the Serbian authoritarian ideology with that of the Italian fascism of the Mussolini era. (Lazić, 2020)

Although, as was said above, authoritarianism remains a fundamentally disputed political concept, in this paper we will try to emphasize the fact that Serbian authoritarianism continues to establish a superior logic over Serbian political thought. As such, Serbian authoritarianism has completely undermined the main frameworks of liberal democracy. (Levitsky & Ziblatt, 2018)

Serbian Democracy and Authoritarianism

A Complex Relationship Serbia has a complex political history, and the contested nature of Serbian authoritarianism has been a subject of interest for many scholars (Vujadinović, 2017). This paper aims to explore the reasons and logic behind the installation of authoritarianism in Serbia, its relationship with democratic practices, and how it led to the genocide in Kosovo at the end of the 20th century. The fight for the definitive disappearance of Albanians from Kosovo was embedded in the logic of Serbian authoritarianism. (Pavković, 2003) The Serbian Army Headquarters' coded document named "Potkovicica (Eng: Horseshoe, Alb: Patkoi)" projected this idea, (Deletant, 1999) which was part of the reason why Serbian authoritarianism mocked the norms of democracy, transforming liberal democracy into a farce of its own kind. (Petrović, 2012) The concept of liberal democracy aims to suppress the authoritarian tendency of ignoring the principle of majority rule. (Gagnon Jr, 2009) In a democratic order, the constituent segments of the political corpus govern in harmony, preventing the abuse of one segment against the organic constituents of society. The essence of political liberalism is best reflected in the main propositions of John Locke (1690), where individual freedom is a structuring social norm and power must be effectively limited and kept in check. Jean-Jacques Rousseau's (1762) concept of individual liberty means that power must be limited and kept in check, with the general will overcoming the expression of public opinion, even a majority. It refers to the type of regime, values, and norms that regulate political and social life for several generations of citizens. The general will, public liberties, and the separation of powers, along with a free press and free speech, prevent tyranny through checks, balances, and oversight. (Bobić & Mitrović, 2018) Did Serbian society develop such over-

sight mechanisms throughout the existence of the modern Serbian state? It is difficult to assert that it managed to do so, even when the Serbian Social Democracy led by Dimitrije Tucović (2013) was laying the foundations of a real democracy in the field of Serbian political thought. Francis Fukuyama (2011) emphasizes that the goal of political liberalism is the management of diversity in pluralistic societies, where power in democracy is limited by the embodiments of the liberal component of democracy. Different sources of power and legitimacy coexist and check each other, arising from the need to regulate public powers for the benefit of individual rights and freedoms. However, did Serbian society ever seriously set these goals and ideals for itself? Since the creation of the state in 1878, Serbia has been promoted as an expansionist state, with its appetite for expansion not hesitating to expand at the right moment even towards western to the detriment of Bosniaks. (Cohen, 1996) The assassination of Prince Franz Ferdinand in 1914 served as the trigger for the start of the First World War, which was based on the prerogatives of the Serbian strategy for the creation of Greater Serbia. (Dedijer, 1990) Political liberalism is based on tolerance and political compromise, while the logic of Serbian authoritarianism is based on the ideology of the Serbian Church and the pre-political ideas of the era of the Serbian Renaissance, on the basis of which the paradigm of modern Serbian nationalism was conceived, contradicting liberal thought. (Pavković, 2007) Serbian authoritarianism owes to a series of practices and expectations derived from true, half-true, and slanderous demands from the Church in relation to Albanians. (Ramet, 2006) Serbian authoritarianism turns out to be the product of a group of political beliefs about how power should be exercised within the corpus of the Serbian state, based on the general claim that elites confiscate its power, resources, and agencies, therefore it, that is, the State, is on par with the Church, must be protected by the army and remain in the service of the Serbian.

This is also determined by the Serbian terminology “vozhd”. According to scientific research, the term “Vozhd” has its etymological origin in the Proto-Slavic language “Vodъ” and was historically used to indicate a chief of a tribe. With the emergence of statehood, the term was also used to refer to a leader or supreme commander, especially when these two roles were combined in one person. This usage was widespread throughout the Slavic regions. (Bjelajac, 2018; Bjelic and Savic, 2004; Milivojevic, 2007)

In the context of Serbian political history, the positions of political leader and supreme commander have always been merged into one person, with the term “Vozhd” being used to refer to this figure. However, this political system has evolved over time into a system characterized by authoritarianism and a constant desire for expansion at the expense of neighboring countries.

One of the consequences of Serbian authoritarianism has been the creation of social homogeneity and resistance to opposing political views, as well as to intellectuals and elites who are perceived as a threat to the Serbian state and identity. Spreading fear and distrust

of politicians and intellectuals is seen as a way to maintain power and control. This feeling continues to be present even today in Serbia. (Bjelajac, 2018; Pavlovic, 2018; Milivojevic, 2007).

Examining the Logic of Neo-Fascism and Its Implications for Society

The rise of neo-fascist leaders around the world has become a concerning trend in recent years. The logic of these leaders, characterized by their authoritarianism and disregard for democratic norms, shares similarities with herd mentality (Gagné, 2020). Modern heads of state and government tend to observe and imitate each other, following the direction of the herd (Stan, 2020). This phenomenon is akin to how Hitler followed Mussolini in the past (Betz & Meret, 2018). In the present, the herd is moving in the direction of fascism, as seen in leaders like Maduro, Erdogan, Putin, Orbán, and Vučić (Albright, 2018, p. 287). Despite their differences, there is much that unites them in their neo-fascist ideology (Wodak & Boukala, 2020).

Neo-fascist rulers treat power not as a privilege, but as an instrument to fulfill their desires (Kallis, 2019). They do not express the need for cooperation with their political opponents, except with oligarchs and specific groups who support them during election campaigns (Gidron & Hall, 2017). They see themselves as “powerful leaders” on whom the fate of the nation depends. This logic of modern neo-fascists is similar to that of despots, as they are willing to reject the complexity of the social order, reject elites, and reject the idea of representation (Ignazi, 2018).

Fascism is characterized as “a redemptive excess of patriotic arbitrariness”, according to Putin’s ideological adoptive father, Ivan Ilyin (Žižek, 2017). Similarly, Vučić’s fascism in relation to the Albanians is based on bloodshed for the extinction of Kosova as a political entity and the annexation of its rich north with mining and water assets at any cost. This logic stems from the neo-colonial concept of the Russian and Serbian elites, who have often enjoyed some kind of support even from a neighborhood of Western European states (Eyal & Buchholz, 2019).

The position of the German minister on the occupation of Ukraine by Russia (Radynski, 2022) highlights the desire of some Western European states to maintain stability and the status quo at all costs, even if this means that Ukraine slips into the territory of Russian neo-colonialism. In this context, the Franco-German draft for Kosova and the conclusion of the imposed dialogue with Serbia represent a tendency for the return of Serbia to regional power and Kosova to a typical neo-colony.

In Article 7 out of a total of 11 articles in the document, which in the meantime was also officially named the Agreement on the normalization path between Kosova and Serbia, it is stated that:

“Both Parties commit to establish specific arrangements and guarantees, in accordance with relevant Council of Europe instruments and by drawing on existing European experiences, to ensure an appropriate level of self-management for the Serbian community in Kosova and ability for service provision in spe-

cific areas, including the possibility for financial support by Serbia and a direct communication channel for the Serbian community to the Government of Kosova. [...]” (European External Action Service, 2023)

Meanwhile, in Article 10, in the second paragraph, it is explicitly emphasized that: “Both Parties confirm their obligation to implement all past Dialogue agreements, which remain valid and binding.” (European External Action Service, 2023)

This paragraph highlights a contentious issue with the 2013 agreement, which is believed to have been influenced by blackmail against the former prime minister of Kosova. The subsequent Agreement on Principles (2015) was considered incompatible with the conditions that the Constitutional Court of Kosova sought to address (*Lidhur Me Vlerësimin E Përputhshmërisë Së Parimeve Që Përmban Dokumenti I Titulluar “Asociacioni/Bashkësia I Komunave Me Shumicë Serbe Në Kosovë [Regarding the Assessment of the Compatibility of the Principles Contained in the Document Entitled “Association/Community of Municipalities With Serbian Majority in Kosova”*, 2015). Furthermore, during the dialogue led by the head of foreign policy of the European Union, Josep Borrell, the Serbian side promoted the “Republika Srbska 2” model in the region, which could result in the defunctionalization of the Republic of Kosova. If implemented, this action could lead to an escalation of hostilities with more catastrophic consequences than the previous conflict of 1998/99, signaling a shift from a hybrid war to a more destructive one.

It has become clear that the Draft Agreement bears a striking resemblance to the 1972 agreement between the Federal Republic of Germany and the German Democratic Republic (German Historical Institute, 1972), which was founded on the principles of Ost-Politik (The Willy Brandt Biography, 1958), a foreign policy initiative developed by Bonn’s political elite, with support from the former chancellor, W. Brandt. The agreement proved successful in the case of the two German states, as the acceptance of political realities led to a new approach by the Federal Republic towards the Soviet Union. The spirit of German-Russian relations, fostered by the inter-German and Ost-Politik agreement, created a tacit understanding between present-day Germany and the Russian Federation regarding a swift Russian invasion of Ukraine, on the assumption that the central government in Kiev would fall quickly. However, this assessment turned out to be wrong, as both the Kremlin and Berlin failed to anticipate the mass resistance of the Ukrainian population.

The Franco-German draft, however, differs from the colonialist logic, but the parties that imposed it could not free themselves from the revisionist concept that has been adopted by a group of Western diplomats in connection with the NATO intervention in Serbia (1999) to put an end to the Serbian genocide. Illustrative of this phenomenon is the statement of Ambassador Christopher Hill, where he expresses his regret for that intervention (Gazeta Tema [Tema Journal], 2023).

Unpredictability as a Weapon: An Analysis of Hybrid Warfare in Kosova

In 1999, the North Atlantic Treaty Organization (NATO) launched a military intervention in Kosova, then a province of the Federal Republic of Yugoslavia, in response to the humanitarian crisis resulting from the conflict between the Yugoslav army and the Kosova Liberation Army (KLA). (BBC News, 1999). The intervention, led by NATO and known as Operation Allied Force, lasted for 78 days and eventually forced Yugoslavia to withdraw its army from Kosova. However, the intervention also had unintended consequences, including strengthening Serbian nationalism and developing a hybrid warfare strategy that Serbia would later use in Kosova and other regions (Bacevich, 2018).

Serbia's hybrid war in Kosova began almost immediately after NATO's intervention. In response to the deployment of NATO forces in Kosova, Serbian authorities withdrew their military and police forces, leaving a security vacuum. In this vacuum, Serbian paramilitary groups, such as the Akrepi and the Tigers, launched a terror campaign against Albanian civilians, including mass killings, rapes, and forced deportations (Human Rights Watch, 2001).

At the same time, Serbian authorities launched a disinformation campaign aimed at undermining the legitimacy of the Albanian leadership of Kosova and creating confusion among international actors. Serbian media portrayed the KLA as a terrorist organization and accused the Albanian population of committing atrocities against Serbs. Serbian officials also spread rumors and false information about the presence of Al-Qaeda and other terrorist groups in Kosova, in an attempt to convince the international community that Kosova was a security threat (NATO, 2001).

Serbia's hybrid war in Kosova also included cyberattacks and other forms of sabotage. In 2000, Serbian hackers launched a series of attacks against NATO websites, causing significant disruptions (BBC News, 2000). Serbian authorities also engaged in economic warfare, imposing trade and energy blockades in Kosova in an attempt to undermine regional stability (International Crisis Group, 2000).

Serbia's hybrid war in Kosova had several objectives. One was to prevent the creation of an independent Kosova; which Serbia saw as a threat to its territorial integrity and national identity. Another was to create a security threat that would require the presence of international forces in the region, thus limiting Kosova's independence and sovereignty. Finally, the hybrid war aimed to demonstrate Serbia's resilience and determination in the face of international pressure and to mobilize popular support for the government (Bacevich, 2018).

Serbia's hybrid war in Kosova was ultimately unsuccessful in achieving its objectives. In 2008, Kosova declared independence from Serbia and is now recognized as a sovereign state by a majority of countries.

However, the lessons of Serbia's hybrid war in Kosova have been studied and applied by other actors, including Russia, which has used similar tactics in Ukraine and elsewhere (Galeotti, 2017). The main lesson of Serbia's hybrid war in Kosova is that unpredictability can be a powerful weapon in modern warfare. By creating confusion, insecurity, and fear, a state or

non-state actor can undermine the opponent's ability to respond effectively and achieve its objectives at minimal cost and risk. Unfortunately, this also means that the use of hybrid warfare is likely to continue in conflicts around the world, posing a significant challenge to traditional military strategies and international norms. As such, it is essential for policymakers and military leaders to recognize the threat of hybrid warfare and develop effective strategies to counter it, including improved intelligence gathering, stronger cybersecurity measures, and expanded international cooperation. Only by staying ahead of the curve and adapting to the changing nature of modern warfare can we hope to preserve peace and stability in the face of these new and evolving threats.

Conclusions:

In this scientific paper, we have examined the concept of Serbian authoritarianism and its impact on the dynamics of hybrid warfare in the context of Serbia's policy towards Kosova. We have highlighted the historical tensions between Serbia and Albanians, which have contributed to the development of authoritarianism and the use of hybrid warfare against Kosova. We have also raised concerns about the threat of hybrid war and the crisis of democracy faced by the Western world.

Our analysis shows that the Serbian government under Aleksandar Vučić embodies many of the key characteristics of authoritarianism, including demands for blind obedience, the absence of underlying ideologies, and a manipulation of the masses through tactical rhetoric. This form of authoritarianism has undermined the foundations of liberal democracy in Serbia and led to a system characterized by authoritarianism and a constant desire for expansion at the expense of neighboring countries.

We have also examined the relationship between Serbian authoritarianism and democracy, highlighting the complex history of these two concepts in Serbia. While liberal democracy aimed to prevent the abuse of power, it is difficult to assert that Serbian society has managed to establish oversight mechanisms to prevent tyranny. The logic of Serbian authoritarianism is based on the ideology of the Serbian Church and the pre-political ideas of the era of the Serbian Renaissance, contradicting liberal thought.

Furthermore, we have discussed the rise of neo-fascist leaders around the world and their rejection of democratic norms, complexity, and elites. The agreement between Kosova and Serbia may lead to the de-functionalization of the Republic of Kosova and escalation of hostilities. Therefore, it is essential to monitor and address the rise of neo-fascist leaders and their ideologies to prevent further harm to society.

Finally, we have examined the power of unpredictability as a weapon in modern warfare, demonstrated by Serbia's hybrid war in Kosova. The continued use of hybrid warfare poses a significant challenge to traditional military strategies and international norms. To counter this threat, policymakers and military leaders must develop effective strategies, including improved intelligence gathering, stronger cybersecurity measures, and expanded international cooperation.

Only through these efforts can we hope to preserve peace and stability in the face of these new and evolving threats.

Based on the conclusions presented in this section of the scientific paper, several strong suggestions can be made:

1. The international community must take a more active role in monitoring and addressing the threat of Serbian authoritarianism and hybrid warfare, particularly in the context of Kosova. This includes developing more effective strategies for detecting and countering disinformation and propaganda campaigns.

2. It is essential to promote and strengthen the values and principles of liberal democracy in Serbia and other countries facing similar challenges. This can be achieved through support for civil society organizations, independent media, and the rule of law.

3. The rise of neo-fascist leaders and their ideologies must be carefully monitored and addressed, as they pose a significant threat to global peace and stability. This requires a coordinated international response, including efforts to promote tolerance, diversity, and respect for human rights.

4. Policymakers and military leaders must develop effective strategies to counter the threat of hybrid warfare, including improved intelligence gathering, stronger cybersecurity measures, and expanded international cooperation.

5. More research is needed to understand the complex relationship between authoritarianism and democracy in Serbia and other countries facing similar challenges. This includes exploring the historical, cultural, and ideological factors that have contributed to the rise of authoritarianism and the erosion of democratic institutions.

Overall, the scientific paper highlights the urgent need for a coordinated international response to the threat of Serbian authoritarianism, hybrid warfare, and neo-fascism. By working together to promote liberal democratic values, counter disinformation campaigns, and develop effective strategies for modern warfare, we can hope to preserve peace and stability in the face of these evolving threats.

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PSYCHOLOGICAL SCIENCES

NEGATION AND ASSERTION FROM THE POINT OF VIEW OF THE THEORY RESULTS

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ОТРИЦАНИЕ И УТВЕРЖДЕНИЕ С ТОЧКИ ЗРЕНИЯ ТЕОРИИ РЕЗУЛЬТАНТЫ

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Abstract

This article is a logical continuation of the previous one [1]. Its purpose is to clarify, deepen and gradually expand this concept, since, in our opinion, it has not only theoretical, but also great practical significance. We decided to start from where our *history* of the study of negation and affirmation began in psychology and, at the same time, from the point of view of *the theory of resultants*.

Аннотация

Данная статья является логическим продолжением предыдущей [1]. Её цель - уточнение, углубление и постепенное расширение данной концепции, так как она, на наш взгляд, имеет не только теоретическое, но и большое практическое значение. Мы решили начать с того, с чего началась наша *история* изучения отрицания и утверждения в психологии и, одновременно, под углом зрения *теории результанты*.

Keywords: negation, assertion, resultant theory, historical approach, genetic approach, vector effect.

Ключевые слова: отрицание, утверждение, теория результанты, исторический подход, генетический подход, эффект вектора.

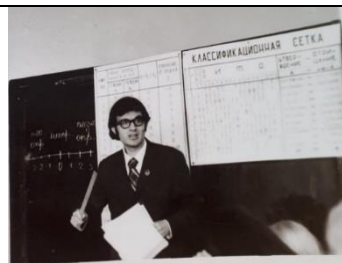
Учитывая тот факт, что опубликованная нами статья „*Вектор эффекта или концепция результанты*” в *Deutsche internationale Zeitschrift für zeitgenössische Wissenschaft* [1] вызвала большой резонанс, мы решили продолжить изучение, уточнение, углубление и постепенное расширение данной концепции, так как она, на наш взгляд, имеет не только строго теоретическое, ограниченное, но и большое, фактически неограниченное, практическое значение. Причём, не только для науки как таковой, но и для повседневной жизни и деятельности человека на каждом шагу.

Начнём с того, что полученный эффект вектора (результат) может отличаться по своему неограниченному качеству, количеству, уровню и т.д.и.т.п. и их безграничному взаимодействию. Следует отметить, что в процессе научного исследования, порой, бывает так, как писал в своём послании к римлянам ап. Павел (глава 11, стих 33): „О, бедна богатства и премудрости и ведения Божия! Как непостижимы судьбы Его и неисследимы пути Его! Ибо кто познал ум Господень? ... Ему слава во веки, аминь” [2]. Таким образом, пути Господни самые неожиданные.

Какими же путями мы следовали в наших научных исследованиях отрицания и утверждения

как основные мыслительные операции человека и что нового нам удалось открыть в этой неувоенной и неизвестной на первоначальном этапе области? Проанализируем в этом смысле указанные операции, отрицание и утверждение, с точки зрения *теории результатов*.

Хронологически, чтобы выяснить сложную природу отрицания и утверждения, изначально мы решили предпринять *междисциплинарный подход*, потому что о них в психологии доселе не писали и не говорили. Сначала изучили то, что было более заметно на поверхности, его внешние формы выражения: *лингвистический* аспект (*да, нет* и т. д.). Затем перешли к *логическим* формам передачи отрицания, так как оно есть конечный продукт анализа и синтеза, которые всегда взаимодействуют друг с другом и выражаются через определенные предложения. После этого мы обратились к *философии* отрицания, под которой, начиная с античности, понималось небытие, нехватка, бесконечность, возможность, противоположность, противоречие и т. д. Со второй половины XIX века, когда психология постепенно стала самостоятельной генетической и прикладной экспериментальной наукой, произошла и дифференциация психологического аспекта отрицания. Он начинает отличаться от *психопатологического* аспекта, от Синдрома Котара (*Le délire des négations – Бред отрицания*) [3]. Наконец, выделил *психологический* аспект отрицания, поскольку, как известно, „патология, разлагая и упрощая, часто открывает нам то, что для нас замаскировано, слито и усложнено в физиологической норме” (И.П. Павлов).



Психологический аспект отрицания и утверждения, как мы предположили, состоит в изучение механизмов этих операций и их онтогенез. Для изучения механизмов отрицания и утверждения мы модифицировали (соответственно цели исследования отрицания и утверждения в психологии) тест личностных конструкторов Г.А. Kelly и шкалу D. (Donald) Bannister, проверяя их валидность, экспериментируя модифицированной вариант этого теста, тем самым вводя *метод и шкалу детерминирования определённости и неопределённости положительных и (или) отрицательных суждений*, доказывая экспериментально и статистически фундаментальную идею отца всемирной психологии Аристотеля *о связи отрицания и неопределённости*, сформулированную гениальным стагиритом в его известном трактате „Об истолковании”. Это то, что до сих пор является принципом *Negativa non probantur* в римском праве — (*лат.*) *отрицательные положения не доказываются*. Всё это составило мою дипломную работу „Психологическая природа отрицания”, которую защитил с отличием в Москве в МПГУ им. В.И. Ленина по специальности „Педагогика и школьная психология” 21 мая 1973 года (науч. рук. М. С. Роговин, др. психол. н., проф.).



Фото до и после защиты дипломной работы.

В то время (50 лет назад) мы не представляли ещё до конца, что установление *определённости - неопределённости* будет иметь такое большое значение и влияние, какое оно имеет сегодня в любой сфере нашей жизни и деятельности: в экономике, энергетике, политике, юриспруденции, медицине, обороне и т. д. и т. п., да и в повседневной нашей жизни.

Результаты этого исследования были рекомендованы Государственной комиссией к опубликованию в научный журнал „Новые исследования в психологии” и были зарегистрированы датой поступления статьи в редакцию 08.06.1973 г. в соответствующем научном журнале на первых же страницах (см. *Экспериментальное изучение операции отрицания методом конструктивного теста* / М. С. Роговин, И. Н. Козлова, П. С. Желеско // Но-

вые исследования в психологии. Москва: Педагогика, 1974, № 3, С. 3-5) (М.С. Роговин, науч. рук дипломной работы, д.п.н., проф. и И.Н. Козлова, аспирантка, которая перевела тест личностных конструкторов (представлено в „Новые исследования в психологии” Т.А.Власовой, член-корреспондент АПН СССР) [4].

Эти идеи получили дальнейшее развитие в кандидатской диссертации „Экспериментально-психологическое исследование отрицания в дошкольном и школьном возрасте”, которую защитил в 1982 г. в Москве в МГУ им. М.В. Ломоносова. Они были развиты и опубликованы также в научной монографии „Исследование отрицания в практической и познавательной деятельности (Кишинёв: Штиинца, 1985. 135 с.) (соавтор М.С. Роговин; рецензенты Г.В. Залевский, В.Н. Крупнов, А.В. Соловьёв) [5].



Фото во время защиты кандидатской работы.

Так, в кандидатской диссертации П.С. Желеску предложил новую, нетрадиционную методику исследования генезиса отрицания в дошкольном и школьном возрасте, которую обосновал теоретически и экспериментально, продемонстрировав тем самым функционирование отрицания на деятельностно-интуитивном (подсознательном) уровне, начиная с 4-5-летнего возраста, на основе механизма практического/мануального ограничения а также функционирования отрицания на концептуальном/понятийном (сознательном) уровне, на основе которого задействуются механизмы создания неопределенности и/или её преодоления посредством вербальной/семиотической формулировки соответствующего отрицательного понятия, суждения, умозаключения, начиная с 7-8 лет по значимым аффективным признакам а с 11-12 лет на основе абстрактных значимых признаков.

Таким образом, нам удалось обобщить и определить отрицание в психологии на научной основе: **отрицание** – это мыслительная операция, осуществляемая с помощью языковых средств, с возможностью выработки на этой основе семиотического выражения, ориентированного на фиксацию неопределённости предмета, явления в пределах соответствующей познавательной задачи и одновременно способная уменьшить эту неопределённость путем ограничения/определения данного предмета, явления. Благодаря отрицанию мышление приобретает диалектический характер, создавая возможность одновременно мыслить предмет, явление как то, чем они „есть”, а также как то, чем они „не является”, без того, чтобы субъект/человек подозревал об этом факте (см. в ж. Вопросы философии, 1985, № 12, с.151 – 153: Кудрин А.К. Критика и библиография. Книга П.С. Желеску, М.С. Роговин. Исследование отрицания в практический и познавательной деятельности. Ред. В. А. Лекторский; Бельц. Гос. Пед. Ин-т им. А. Руссо. Кишинёв: Штиинца, 1985. 135 с.) [6].

Затем последовало исследование формирования и развития утверждения и отрицания у детей

раннего возраста, посвященное решению актуальной, но малоизученной и дискутируемой проблемы (см.: Желеску П.С., Толоченко Д.П. Формирование и развитие утверждения и отрицания у детей раннего возраста. Chişinău: CEP UPS, 2022. 214 с. ISBN 978-9975-46-621-9; (рецензенты Низовских Н.А., Негурэ Ион) [7]. Были проанализированы бихевиористский, психоаналитический, операционалистский, социально-прагматический и деятельностно-системный подходы. На основе новейшего научного подхода дано определение утверждения и отрицания как интеллектуальных операций, образующих единую, целостную, многоуровневую функциональную систему, иерархическую и соотносимую с основной целью деятельности человека в данной конкретной ситуации. Мы впервые предприняли попытку не только констатировать текущий уровень развития утверждения и отрицания, но и формирования этих мыслительных операций, выявить, таким образом, следующий уровень их развития у детей раннего возраста (от 1-го до 3-х лет). Следуя этому факту, мы обнаружили и описали основные условия, обеспечивающие их формирование, выяснили один из психологических механизмов их функционирования. Полученные экспериментальные данные статистически значимы, а применяемые методики достоверны и точны. Разработанная система упражнений (деятельности) может быть применена в практике дошкольного образования и воспитания для формирования и развития утверждения и отрицания у детей раннего возраста.

В 2000 году, после проведения длительного, скрупулёзного, глубокого и обширного теоретико-экспериментального исследования на протяжении 15 лет, я представил результаты этого научного исследования в монографии: Jelescu Petru „Генезис отрицания у детей в доречевом периоде”. Ответ. ред. Ion Negură. Рецензенты Aurelian Silvestru, Raisa Tereşciuc.. Chişinău: Muzeum, 1999. 248 с. ISBN 9975-905-27-7 [8]. и успешно защитил докторскую диссертацию по психологии на тему „Генезис отрицания у детей в доречевом периоде: экспериментально-теоретическое исследование”. Chişinău, 2000. 249 с.



Фото во время защиты докторской диссертации и после.

Защита состоялась в одноразовом Специализированном Учёном Совете при НИИ Педагогики Республики Молдова с участием ученых и известных официальных оппонентов из России и Румынии.

В опубликованной работе [8] я изложил и продемонстрировал новое, деятельностно-системное научное направление в изучении психологии отрицания, создав впервые в науке и представив множество новых, оригинальных методик исследования генезиса отрицания у „немого” ребенка в неговорящем периоде.

Впервые была сформулирована, обоснована и применена концепция *результатирующего* активного многофакторного гибкого перманентного взаимодействия в психическом развитии личности/ребенка, группы в деятельности, общении и поведении.

Установил около 50 новых закономерностей возникновения и развития отрицания у детей в этот решающий период человеческой жизни.

Выделил и описал новый комплекс в психической деятельности человека, названный комплексом социальной неудовлетворенности (КСН) или комплексом отрицания/неблагодарности (КО/КН) и его генезис у человека.

Выявил новые уровни и механизмы функционирования отрицания в периоде неговорения ре-

бенка, тем самым уточнив и дополнив общую теорию систем (ОТС) и общую теорию систем с индексом „Урманцев”/ОТС (У) с указанием на развитие чего-либо или явления не только по горизонтали или вертикали, но и по «горизонтальной вертикали» и/или по „вертикальной горизонтали”, что придает этому процессу диалектический, спиралевидный характер (см.: Nicola Grigore. Критика и библиография. Книга: Jelescu Petru „Генезис отрицания у детей в доречевом периоде”. Ответ. ред. Ion Negură. Рецензенты Aurelian Silvestru, Raisa Tereşciuc. Chişinău: Muzeum, 1999. 248 с. ISBN 9975-905-27-7. В: *Revista de psihologie*. Новая серия. 2001, Том 47, 1-2, сс. 143 – 144. Bucureşti: Издательство Академии Румынии).

Изучив генезис отрицания и утверждения у детей в довербальный период (от 1 г. до 3 лет), мы исследовали затем *само происхождение* утверждения и отрицания у Дмитрия. нашего ребёнка, сразу же после рождения. Для этого применили *журнальный метод* (см.: Jelescu Petru, Jelescu Raisa. *Генезис утверждения и отрицания у ребёнка*: Журнал наблюдений и проб с Dumitraq Jelescu (case study method/метод тематического исследования). Chişinău: S. n., 2021 (СЕР UPS). 81 p. ISBN 9975-46-579-3. Рецензенты: Ion Negură, Aglaida Bolboceanu) [9].



Регистрация Дмитрия в качестве гражданина Республики Молдова в ЗАГС-е г. Бельцы в возрасте одного месяца.



*Dumitru Jelescu. Год рождения 26.03.1989. В этом году исполнит 34 года.
Обучение: бакалавриат, магистратура, аспирантура.*

Анализируя и обобщая полученные результаты, мы обнаружили ряд новых *закономерностей* психологии развития: **а)** возникновение и развитие Нет и Да происходит от общего, сложного и туманного к частному, дифференцированному и уточненному; **б)** утверждение как приобретенное интеллектуальное действие (Да), формирующееся и развивающееся в онтогенезе в постнатальном периоде, первоначально проявляется на *невербальном* уровне, в виде комплекса оживления/реанимации/реактивации (движения, мимика, вокализации, положительные эмоции и т. д., выражающие удовлетворение, удовольствие, утверждение (=комплекс оживления по Н.М. Щелованову, Н.Л. Фигурину, М.П. Денисовой, М.И. Лисиной и др.); **в)** отрицание как ассимилированное интеллектуальное действие (Нет), формирующееся и развивающееся в ходе онтогенеза в постнатальный период, первоначально проявляется на невербальном уровне в виде *комплекса отрицания* или *комплекса социальной неудовлетворенности*, которого мы также называем социальным комплексом неблагодарности (движения, мимика, вокализации, отрицательные эмоции и т. д., выражающие неприятность, неодобрение, неподтверждение (Petru Jelescu); **г)** между комплексом оживления и комплексом неудовлетворенности/социальной неудовлетворенности также на невербальном уровне проявляется другой, промежуточный комплекс, а именно *комплекс когнитивного спокойствия*, заключающийся в активном исследовании ребенком собственных рук, ног, головы, тела в целом, фиксируя и концентрируя взгляд на окружающие существа, вещи в спокойном, тихом и относительно длительном их преследовании, в их постепенном, последовательном, снисходительном изучении, без внезапных вокализаций и движений в виде вдоха или выдоха (Raisa Jelescu); **д)** на следующем этапе утверждение выражается через более совершенные средства каждой *части* комплекса оживления (многократное кивание сверху вниз, взятие руками того, что ему дают и т. д.) (P. Jelescu); **е)** на следующем этапе отрицание выражается через более совершенные средства *каждого* компонента в составе комплекса социальной неудовлетворенности (многократное кивание слева направо и наоборот, отбрасывание руками того, что дают, повороты туловища и т. д.) (P. Jelescu); **ж)** затем следует протOVERбальная стадия (от новогреческого protos - первый, первая), когда

высказывание выражается в виде На (в смысле Давай), Дай-дай-дай! (также в смысле Давай), Па-па (также в смысле Давай кушать - молоко и т. д.) (P. Jelescu); **з)** на протоглагольном этапе отрицание выражается через Не-не-не! (сердитый крик), Я! (отказ), О-дн! (что означает «Не ты»), «Н-к-ы» (Нет) и т. д. (P. Jelescu); и т. д.



1. Анализируя факторы психического развития в целом и факторы интеллектуального развития в частности, Petru Jelescu и Marcel Teleucă (постдокторант нижеподписавшегося, первый слева) обнаружили, что существует множество групп и, следовательно, множество представлений об этих факторах и их роли в психическом развитии человека: биогенетическая концепция; социогенетическая концепция; концепция сближения двух факторов, биологического и социального, но с решающей ролью влияния биологического фактора; концепция конвергенции двух факторов, биологического и социального, но при решающей роли влияния социокультурного фактора; и др.

После ряда теоретических, экспериментальных и практических исследований, проведенных на протяжении многих лет, Petru Jelescu сформулировал *концепцию результирующего взаимодействия* контролируемых и/или неконтролируемых факторов непрерывного/прерывного развития или *концепцию комбинированного взаимодействия* множества причин *как относительно необходимых и достаточных*, согласно которым не только общее психическое развитие, но и развитие каких-либо отдельных психических способностей является результатом контролируемого и/или неконтролируемого активного многофакторного гомогенного и гетерогенного постоянного гибкого взаимодействия индивида и/или группы на протяжении всей жизни или в том или ином возрасте онтогенетического развития в рамках человеческой деятельности, общения и поведения (см.: Jelescu Petru, Teleucă Marcel. *Проблема факторов развития математического интеллекта*. В ж.: Psihologie, Pedagogie specială, Asistență socială, 2020, № 3(60), с. 28-39).

Эта концепция является продолжением и вариантом развития деятельностно-системной концепции, разработанная и продемонстрированная в контексте теоретико-экспериментального изучения генезиса отрицания и утверждения у детей, подростков и взрослых. Концепция результатности (КР) является одной из существующих или потенциально существующих концепций относительно факторов психического развития и формирования личности. Мы придерживаемся ею при математической подготовке довузовских учащихся и университетских студентов к олимпиадам и конкурсам, как национальных так и международных, являясь достаточно адекватной. (см.: Teleucă Marcel, Jelescu Petru. *Концепция одаренных по математике учащихся и их подготовка к конкурсам и олимпиадам* [10] ; Teleucă Marcel, Jelescu, Petru *Проблема взаимоотношений: интеллект - интеллектуальная одаренность - врожденная предрасположенность - личные способности* [11]. Концепция результатности или *общая теории эффекта* [1] обсуждалась и была воспринята довольно положительно на нескольких национальных и международных научных конференциях, а также в общепризнанных международных журналах [12] ; *EcoSoEn, Scientific Journal Economics, Social and Engineering Sciences*, nr.3-4/2022, сс. 83-91. "B" Category. ISSN 2587-344X; E-ISSN 2587-425X [13]; и др.).

Таковы были решающие шаги в научном исследовании утверждения и отрицания в психологии, в формулировании и обосновании концепции результатности как общей (= универсальной) теории в науке. Упомянем, что все эти шаги осуществлялись нами одновременно с нашими большими педагогическими и воспитательными нагрузками (даже слишком большими), с созданием семьи, растением и воспитанием детей, с общественной работой и т. д. Сегодня, несмотря на всё это, исследования продолжаются.

О теоретической и практической значимости этих исследований говорить, по-видимому, нет смысла. Достаточно упомянуть, насколько *определённая или неопределённая* сегодня в мире военная, экологическая, экономическая, климатическая, юридическая и т.д. обстановка. Или насколько разумна *концепция результатности*, которая является универсальной и применимой всегда и везде: в органическом, неорганическом, физическом, химическом и т. д. мирах.

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SOCIAL SCIENCES

COAST POLLUTION IN ALBANIA AND ITS SOCIAL PROBLEMS

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Abstract

Coast pollution is one of the main problems especially in developing countries. This study represents the coastal pollution due to the unsolicited and unprotected development of these areas. Construction of residential, hotels etc in these areas without first having infrastructure built, especially the sewerage, will bring about an increase in pollution in these areas. This study was based on 19 interviews conducted by residents who bought buildings in these areas but also people who were involved in the construction of these facilities, such as investors, engineers, etc. This study extends to an area that lies between Durres and Kavaja in Albania. These interviews represent the state of coastal pollution. It is one of the main causes that formed the conviction of the vacationers who frequented these areas that the waters of these areas are very polluted. This made these areas not to be frequented as before. This reduction has reduced prices but also the reduction of employees in the tourism sector. This study also represents the change of this condition in the period when this infrastructure was realized. The pollution reduction became possible, but the removal of the concept from the holidaymakers that this area is no longer polluted, is more difficult. This area continues to be mentioned as one of the most problematic areas of Albania.

Keywords: Albania, environmental pollution, coast, construction.

1. Introduction

Albania is located in the southwestern area of the Balkan Peninsula and its coastal area is over 400 km long.[1] As Garten, L. points out: coastal areas are waters near the coast and adjacent land areas. Globally, coastal areas are from the most dynamic and rapid change environments.[2] Being a coastal area, there should be a lot of benefits, especially in tourism. [3] Tourism is one of the most profitable branches, especially in the developing area. As Boero points out: Naval and coastal ecosystems provide essential goods and services that support communities and economies, including food safety, recreational opportunities and other benefits.[4]

These benefits are reduced when you fail to manage the development of the coastal area. This lack of management will bring about the underdevelopment of major branches such as tourism and fishing. As Fisher points out: Coastal communities in all developing countries suffer from high levels of poverty and low levels of education.[5] This study was based on the area between Durres and Kavaja, where before 1990 it was one of the best tourism areas. This is one of the areas where after 1990 it was built more. From 2005 to 2011, only in the Prefecture of Durres have been granted construction permits for buildings with a construction surface of 1,441.000 m². [6]

This uncontrolled construction brought a lot of problems; pollution is one of these problems. Unplanned expansion of rural and urban areas is a widespread phenomenon in Albania.[7] This study highlights the pollution of this area, as well as some of the causes that lead to the pollution of this area.

In 2016, the study conducted by the Ministry of Environment shows that the area from Durres to Kavaja continues to be the most polluted.[8] As well, the Municipality of Durres in 2015 points out that Durres beach continues to have a problem with pollution. The Durres sewage system (special system) was built before the 1990s for a population of 90,000. In those times the connection to the service was 100%. During 1993 to 2007 very limited investments were made in the sewer system, the share of families related to sewage networks is on average 55% in the city. Rural areas have no sewage network. The main way of depositing sewage, especially in informal areas, as well as at 5 NJA are septic pits, the overwhelming of these septic pits go into the agricultural drainage channels with insufficient capacity.[9] This study reveals the reasons why this area became one of the most polluted areas in Albania. Although there is an environmental protection legislation, this is not in many cases appropriate. Unfortunately, the implementation of the existing environmental protection legislation in Albania is often absent due to the lack of experience, low awareness or imperfect staff of local government bodies.[10] The study also highlights the negative impact that this pollution had on the tourism industry. The spread of the fact that this area is polluted brought about the decrease in the number of holidaymakers as well as the lowering of hotel prices, restaurants. Reducing prices was the only way to survive in this area.

The study also represents the change of this area after it has been completed and the underground network has been used, including the sewage network. The construction of this network reduced the pollution of

this area, bringing about the growth of tourists resting in the area.

2. Theoretical Framework

As Diaz Eta points out (2015): Nature contributes to the quality of human life but at the same time, human developments have caused significant loss in biodiversity through overhaul and other promoters of change.[11] It is difficult to justify the preservation of biodiversity without demonstrating its benefits to people[12]

Effective environmental management and protection help maintain high productivity and high diversity in marine systems, protecting social and economic developments.[13] Community - based natural resource management is designed not only to maintain biodiversity but also to soften poverty [13]

While the success of the planning process is ensured by the balanced involvement of the stakeholders, the success of the implementation phase depends on the well - defined incentives for local communities. [12]

Our relationship with coastal areas is a delicate relationship, we get numerous benefits but we have important impacts on the systems approaching these benefits.[14]

3. Methodology

This study used qualitative methodology. When researchers have little information and require rigorous exploration of the research problem learning from participants, quality research is appropriate. [15] For this study, 14 interviews were conducted, with persons who were involved in the construction of these facilities in this area. Participants were randomly selected within this frame. The questions were combined, closed and open questions as well. Open questions were used in order to give the interviewees the opportunity to describe new information about topics that were of interest. These research conversations lasted from 25 to 35 minutes. They were assured that whatever information they shared would be kept confidential. To preserve their identity, we do not mention their names. Upon completion of the interviews, which were recorded, their transcription and manual coding in vivo began.[16]

4. Result

Construction was one of the industries that took a lot of development after 1991 and was one of the most profitable branches. There were given thousands of permits, the area where there was no construction before, now were overcrowded by the constructions. It also spread to the illegal constructions, the phenomenon of building where it was possible, until 2013 was prevailing. Not even the coastal areas were saved from this wave. This phenomenon is also emphasized during the interview.

Question, that if many residential buildings were built, or hotels in these areas. One resident, among other things, points out that more were built in these areas than inside the city. If before 1990, the area from Plepa to Qerret had no constructions, except for a greenery area, this area became a small town because of constructions.

While, another resident points out, construction in the area became disturbing, if someone bought an apartment overlooking at the sea, it did not pass long when you see a palace being built in front and blocking the view.

What did the inhabitants of the palace do? At first there were protests, even in front of the municipality, prevented machinery from working. But the facility was on a permit from the municipality and could not be obstructed by force, so it was built. But, in many cases, residents could not stop building the facility even when it was without permission. This brought no one to protest anymore.

Questions why so many construction permits were given in these areas.

A contractor emphasizes; The sales of apartments in these areas were very fast. At the beginning, as long as the pits were opened to build the foundations, a good portion of the apartments of the palace were sold. This made it possible for the companies' profits to be high.

Questions how these companies could get permission in these areas, being coastal areas. One resident points out: These companies with their acquaintances were able to press in the municipality to obtain a building permit in these areas. This was justified by the situation where there was no development plan by the municipality for this area. Instead of prohibiting construction until a plan was made, the opposite was made, they were given permission without criteria.

Questions that if objects without construction permits were able to be built in this area. One technician who had worked in this area states: I can say that they were built a lot, it was difficult to stop, there was no will on the part of state structures to operate. Illegal construction was common throughout Albania, especially after 1997.

Whereas one resident points out, illegal construction exploded after 1991, you can say that more buildings were built without permission than with permission. Not only small villas but palaces as well were allowed to be constructed without permission. These unlawful mansions were also built by the sea. But what about these objects, were they demolished over time?

Another resident states: you can not talk about demolishing, they were all legalized and became lawful, although at first there were voices that would that would not be legalization of illegal constructions in coastal areas.

Since the infrastructure was missing, the people who bought these apartments, either were not informed about the lack of underground infrastructure, or believed it would be regulated very quickly.

One resident of these palaces points out among other things that when he bought the apartment he did not know where the sewage was spilled. He learned it later when he started using the apartment. He saw the position of the palace near the sea and the interior part of apartment, liked it and he didn't deal with the rest.

Another resident points out that he knew they did not have the necessary infrastructure but hoped to be regulated. Once the necessary infrastructure is adjusted and the price of the apartments will increase.

Another resident, among other things, says: I did not know that the palace I bought had illegal floors, nor did I know where the black waters were unloaded and where they took the water. These came out after the palace is over and we entered to live in.

Unplanned urbanization and without being accompanied by an engineering infrastructure, such as the sewage network, water supply, roads, would also be associated with an increase in pollution. In 2006, Durres had 85 % of clean beaches but in 2009 it went to 69 %.[17] Durres was one of the prefectures with polluted beaches.

From the interview, some reasons were given why these coastal areas were more polluted. Thus, although these construction companies, at the time of construction of the buildings, due to the lack of sewage, they built septic pits. These pits were not under technical conditions.

Thus, an engineer about 70 years old who had been involved in these areas states: in coastal areas, especially from Plepa area to Qereti area, the underground infrastructure was missing, starting with the water supply and sewage network.

Construction companies, although building septic tanks, these pits were not under technical conditions, enabling the black waters to pollute the environment, making this area smell terribly during the summer.

Regarding the way of building these septic pits, a technician that had worked in the area points out: These septic pits were not done with enforced concrete and to be waterproofed so that they were not filtered, but were made outside of technical conditions. They were made with bricks or blocks without waterproofing in order to filter sewage. These septic pits were related to the palace that was constructed. All the polluted water filtered through the sand and ended in groundwater and sea.

Another states that septic pits were made with bricks and not only were not waterproofing but their floor was left as it was, sand, to filter the water.

There were some investors who went so far as to make it possible for these septic tanks to discharge into the sea, making it possible for these pits to discharge into the sea through an underground pipe. The control of the state bodies at this point was almost non-existent.

Question about whether there were facilities that discharged sewage directly into the sea. A resident of the area points out that: almost everyone in the sea pours septic tanks in that period, the septic tanks were just to say: yes, we have septic tanks.

While an other shows that almost all the facilities that were in the first line, to avoid the bad smell coming from the septic tanks, connected the facility with pipes under the sand up to several meters into the sea.

Meanwhile, another resident says that there were so many buildings that poured the black water directly into the sea, that in that period they were advertised for shares by the state institutions to cut these pipes, which were poured into the sea, but without effects.

Despite the fact that the pollution was high, there were many people visiting the area for summer vacations.

Question if there were many vacationers who frequented this coastline for vacations during that period?

Among other things, one resident emphasizes: there were many people, although it was said that it was one of the most polluted areas.

While another emphasizes: they frequented it a lot, also because of the lower prices, from hotel rooms to restaurants.

While another resident emphasizes that there was a lot of attendance, this was due to the lack of road infrastructure to go to other areas.

The construction of the sewage network and the sewage treatment plan brought an increase in the quality of the beaches in this area. But there are still some other problems.

Question about whether the situation changed after the sewerage and water supply network was completed.

A resident point out: of course, the black water is no longer poured into the sea, the septic tanks are destroyed and all the buildings are connected to the sewage network, this brought an increase in the quality of the beaches in this area.

And another resident emphasizes that this resulted in these beaches being pollution-free. The area began to be frequented by more vacationers.

Another resident, among other things, says that some areas continue to be polluted. Especially the areas, where the water of the streams flows into the sea. These small streams bring the waters of the areas that are close by pouring them into the sea.

Discussion:

This qualitative study highlights the pollution of coastal areas from uncontrolled and not well-planned development. Many coastal areas are at risk due to the harmful effects of increased urban sprawl, industrial pollution and sewage discharges.[2]

As this study shows, the construction of many facilities without building the underground network brought an increase in pollution in sea waters. In the area of Durrës, the beaches near Torres, Plepa and the former Camp of Pioneers are particularly polluted, about 10 times more the allowed rate. In the MMPAU report, it is emphasized that of the 21 beaches observed in Durrës, 90% are classified as Poor Quality and 10% of them as Sufficient Quality. These conclusions list Durrës as the area with the most polluted beaches in the country.[18]

This uncontrolled development was not accompanied by a control of state institutions for the control of environmental pollution, in this way the construction companies benefited from this situation and did not implement the minimum conditions for septic tanks. While the state institutions blamed each other.[19] As Christen points out: Urban flow is also increasing as land is converted to urban and sub-urban use at a rate much faster than the rate of population growth [20] This also leads to an increase in the pollution of coastal areas.

This situation changed a lot when the sewer network and road infrastructure were completed in this area. In 2021, according to the European Union's report on the quality of marine waters in the city of Durres, only 2 areas have polluted waters [21].

Conclusions:

The central and local state institutions should not urbanize an area, especially the coastal areas, without first completing the underground network such as that of black waters and water pipes, but they should also build roads and the electrical network, urbanize the area. Otherwise, this will be accompanied by an increase in polluted coastal areas. The regeneration of these areas takes time.

Also, state institutions should take measures for canals and streams that flow into the sea. The sewage of rural areas or the waters of industrial enterprises must not be poured into these waters, as these waters pollute the marine area where they are poured.

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TECHNICAL SCIENCES

INTERNET OF THINGS (IOT): PROBLEMS AND DEVELOPMENT DIRECTIONS

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Abstract

The article explains the essence of the term "Internet of Things". Various IoT solutions available today, their functionality, the technologies used and the development trends of this concept are analyzed. Also, the most current trends in the development of Internet of Things (IoT) information technologies, solutions developed in accordance with the concept of the Internet of Things are reviewed and analyzed. The main problems, ways and methods of solving this concept are investigated.

Keywords: IoT, RFID, wireless sensor network, IoT architecture, IoT concept, IoT applications, IoT security, IPv6, smart home, smart city, smart enterprise

Introduction.

In 1999, the Auto-ID Center, which deals with radio frequency identification (RFID) technologies and sensor technologies, was established at the Massachusetts Institute of Technology. In the same year, the term "Internet of Things" (IoT) was used for the first time to express the network of objects connected to the Internet by the application of RFID (radio frequency identification) technologies by the Auto-ID laboratory of this center, and thus the concept of IoT was born. (Aliguliyev R.M., Mahmudov R.Sh., 2011)

IoT is a unified network in which a large number of objects are connected through communication and information infrastructure. They exchange information with each other and work in real time without human intervention. The ultimate goal of the Internet of Things is to create a better world for people when objects around them understand their wishes and therefore act without any explicit instructions. Moreover, the quality of management and control systems can be improved by using IoT technologies in various fields of science. Hashimov (2020) shows in his article that "The essence of the IoT concept is that the objects or things that surround us are provided with miniature identification and sensor (sensitive) devices and interact through wired and wireless connections (satellite, mobile connection, Wi-Fi and Bluetooth). communicates and ensures that the processes are performed completely automatically" (Hashimov M.A., 2020).

According to another definition, the "Internet of Things" refers to a globally distributed network (or networks) of physical objects capable of sensing or influencing their environment by interacting with each

other, other machines or computers. Such "smart" objects have a wide range of sizes and capacities - from household appliances, industrial robots, cars, trains to things that exist in the daily life of any person (watch, bracelet, shirt, etc.). (Roslyakov, A.V., 2015)

Today, it is possible to observe areas completely affected by the Internet of Things: Smart cities, environment, health, energy, transportation, public safety, etc. In this article, we will analyze the functionality of IoT solutions available in the modern world.

The purpose of the research: to analyze the problems and benefits of using the Internet of Things in various fields, to examine its development directions.

The main hypothesis of the study is that if the application of the Internet of Things takes place in all fields of activity, it will significantly change the livelihood and life of these people for the better.

Tasks of the study:

1. To analyze and study the researches and literature sources on this problem;
2. To analyze the pros and cons of the Internet of Things;
3. To analyze the directions of development of the Internet of Things in the future;

Research methods:

- 1) theoretical analysis of available materials on the Internet;
- 2) Comparison;
- 3) Sociological survey;

The importance. The importance of research for our region is the demand for the development of various technologies and the improvement of the quality of life at a modern level.

Tədqiqatın materialı və metodları.

In numerous literature and Internet sources, the Internet of Things phenomenon has been described by researchers with completely different models, ranging from technocratic models. For example, the Internet of Things is presented as an infrastructure network that uniquely connects defined physical and virtual objects, objects, and devices through telecommunications.

Nikola Tesla was talking about the IoT when he predicted that the radio would be a "brain center" for small gadgets that would fit in a pocket. And so it happened: the Internet connected all computers into a single network, and household appliances and devices became its tools. The peculiarity of IoT is that the system involves not only computers and phones, but also almost any everyday object equipped with built-in tools and technologies to interact with each other or with the external environment³.

Functionality of IoT solutions

The Internet of Things is sometimes interpreted as a synonym for smart systems: smart devices, smart homes, smart city, smart environment, smart enterprises, etc. Let's take a closer look at them.

Smart devices can collect data, track activities, and customize experiences for users' needs and desires. They can be worn on different parts of the body (head, eyes, wrists, waist, arms, fingers, feet) or these devices can be sewn into different items of clothing. (Papulovskaya N.V., 2022).

A smart home is the integration of technology and services through an Internet network of electronic devices in a home, built to improve the quality of people's lives. Solutions in this category make the life of homeowners more comfortable and enjoyable. Some of them are designed to help the elderly in daily activities and monitoring their health. Due to the high market potential, more and more smart home solutions are entering the market - smart energy and resource management is mainly focused on the interaction of the system and human activity (Shafaqatov R.Ş., 2021).

A smart city is an urban area with developed infrastructure, communication and favorable market. It is a city where information technology is central to providing basic services to residents. Many technology platforms exist, including automated sensor networks and data centers. In fact, urban IoT is focused on using state-of-the-art communication technologies to support additional services for city administration and citizens. The application of the IoT paradigm to the urban context is of particular interest, because it responds to the trend of many national governments in the direction of applying information and communication solutions in the management of public affairs (Shafaqatov R.Ş., 2021).

Smart environment in the city includes smart management of mobility, utilities, buildings. Services supported by the IoT paradigm in a smart city environment include health care facilities, waste management, air

quality, noise levels, congestion, parking, water quality, environmental conditions, etc. can control. For example, the Air Quality EGG device with a sensor system helps monitor air quality (Giuseppe Ruggeri, 2020).

A smart enterprise. Enterprise IoT solutions are designed to support infrastructure and more versatile functionality across industries. Modern enterprises already use several interfaces for smart elements, but in the future, with the increase in computing and communication capabilities of these elements, the boundaries between the production area and suppliers, consumers, workers and researchers, and between production and service may disappear. absolutely. Intelligent mechanisms for collecting, filtering, combining and transforming data can be deployed and operated at the edge of the network or, if necessary, within the network.

Smart environment in the city includes smart management of mobility, utilities, buildings. Services supported by the IoT paradigm in a smart city environment include health care facilities, waste management, air quality, noise levels, congestion, parking, water quality, environmental conditions, etc. can control. For example, the Air Quality EGG device with a sensor system helps monitor air quality (Giuseppe Ruggeri, 2020).

Currently, software is already a key driver in many industries, and the business models of the future will be largely based on IoT mechanisms. If we look at the concept of "Internet of things" more broadly, we will witness many other interesting areas for the application of its possibilities. The most promising are manufacturing, supply chain optimization, energy, healthcare, transportation and logistics. For example, the Irish company Wattics (Wattics, 2011) has developed innovative panels that allow energy consumption to be managed via the Internet. The device analyzes the rationality of electricity use and warns the user in case of excessive energy consumption. The development of the company Cantaloupe Systems from the United States (Cantaloupe Systems, 2012) allows the owners of vending machines to remotely monitor the stocks in them. Timely and optimal replenishment strategies are determined based on contextual information about usage patterns. Another American company - Engaugeinc (Gubbi J., 2013) - is the creator of smart sensors for remote monitoring of security equipment (for example, fire extinguishing systems), which lead to cost reduction and increased life safety. The company provides

Development problems of the Internet of things.

It seems to us that the necessary conditions - technological, social, legal, financial and business conditions - should be created for the widespread application of the Internet of Things. Only then will IoT be widely recognized in the world community. Let's consider some problems that hinder the development of IoT (Gryaznov C.A. 2021).

³ <https://proglib.io/p/top-10-aktualnyh-knig-potehnologiyam-interneta-veshchey-ot-novichka-doprofessionalu-2021-09-11>

Standards and interoperability. Standards are important in creating markets for new technologies. If devices from different manufacturers use different standards, interoperability will be more difficult, additional gateways will be required to switch from one standard to another. In addition, a company that controls different parts of a vertical market (for example, acquiring data, integrating it with other data streams and using it to develop innovative solutions or provide services) can crowd out smaller players and entrepreneurs. The lack of uniform standards can also create obstacles for consumers, for example, when a device from one manufacturer is replaced by a similar device from another manufacturer, it is not possible to transfer accumulated data and users lose virtually no benefit. the data they collect over time.

Security and privacy. As the Internet of Things connects many different devices, the risk of introducing malware at decentralized access points increases. In this case, inexpensive devices located in physically compromised locations are most susceptible to interference.

With remote sensors and key use case monitoring for IoT, sensitivity increases for access and data ownership control. It's worth noting that the recent high-profile data security breach involving Target and Home Depot was made possible by stolen credentials from third-party vendors, allowing attackers to gain access to their payment systems.

Integration challenges. Integrating and testing IoT systems with multiple platforms, multiple protocols, and a large number of APIs is currently a challenge. The rapid development of APIs is likely to incur unforeseen costs on developers, which will negatively impact the ability of project teams to add new features.

Protocol wars and competing standards. The large number of players participating in IoT will inevitably clash with each other as they try to defend their system advantage. Currently, open system advocates are trying to set new standards. We see the actual creation of several standards evolving based on the various requirements dictated by the class of devices, capabilities, capabilities, and needs. This will allow platform vendors and third-party developers to influence future standards.

Specific use cases. Lack of clear use cases or examples showing profit/loss levels slows IoT development. Mass adoption of IoT will require sound, customer-oriented communication and “what's in it for me” messaging. IoT providers should be prepared to talk about the key benefits of their services and do so in as detailed, convincing and specific a way as possible.

Result. The potential of IoT is great, but the presence of problems hinders the development of the Internet of Things. In this article, we identified some of them. Obstacles to the development of the IT industry arise due to the excessive number of devices, insufficient communication between the physical and digital world, open systems and ongoing concerns about privacy and security. Every day, everyone involved in the Internet installation of Items will have to work on these tasks in the near future.

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