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Bad eating habits as the main cause of obesity among children

Złe nawyki żywieniowe jako główna przyczyna otyłości wśród dzieci

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ABSTRACT

Obesity is undoubtedly one of the biggest medical problems of the 21st century. Regrettably, the problem affects more and more children and adolescents. 10% of world's school-aged children have an excess body weight and a quarter of these children are obese. In Europe every fifth school-aged child suffers from an excess body weight. The prevalence of overweight and obesity among Polish adolescents is about 14%.

An excess body weight can be the consequence of genetic factors, endocrine disorders or certain drugs. However, 'simple obesity' is the most common, a consequence of providing too much energy from food products in comparison to energy expenditure (caloric excess). Today's lifestyle promotes the development of obesity. The lack of physical activity, sedentary lifestyle and energy-rich diet are the main causes of an excess body fat accumulation. Because of improper eating behaviours children consume an excess amount of energy, and their diet is deficient in elements necessary for proper development. The examples of such bad eating habits are: snacking highly processed and calorie-rich foods between meals eating in front of the TV screen, skipping breakfasts, drinking sugar-sweetened beverages, "eating out" frequently and "emotional eating".

Bad eating behaviours are crucial factors for the development of obesity. Eating habits are usually formed in early childhood and parents play a very important role in their development.

KEY WORDS: obesity, children, eating behaviours

STRESZCZENIE

Otyłość jest niewątpliwie jednym z największych problemów XXI w. Niestety coraz częściej dotyczy on dzieci i młodzieży. Szacuje się, że na świecie 10% procent dzieci w wieku szkolnym ma nadmierną masę ciała, a 1/4 z nich jest otyłych. W Europie co piąte dziecko w wieku szkolnym boryka się z problemem nadmiernej masy ciała. Wśród polskich nastolatków około 14% ma nadwagę lub jest otyłych.

Nadmierna masa ciała może być spowodowana czynnikami genetycznymi, chorobami endokrynologicznymi lub stosowaniem niektórych leków. Najczęściej jest to jednak tzw. otyłość prosta, która stanowi konsekwencję dodatniego bilansu energetycznego, czyli przewagi energii dostarczanej z pożywieniem nad energią wydatkowaną w procesach metabolicznych. Dzisiejszy styl życia promuje rozwój otyłości. Brak aktywności fizycznej, siedzący tryb życia i wysokoenergetyczna dieta są głównymi czynnikami prowadzącymi do kumulacji nadmiernej masy tkanki tłuszczowej. Ze względu na złe nawyki żywieniowe dieta dzieci zawiera nadmierną ilość energii, jednocześnie jest uboga w składniki odżywcze niezbędne do prawidłowego rozwoju dziecka. Przykładami złych nawyków żywieniowych są: podjadanie między posiłkami często wysokokalorycznej i przetworzonej żywności, jedzenie przed ekranem telewizora, omijanie śniadanie, picie słodzonych napojów, częste jedzenie poza domem oraz jedzenie pod wpływem emocji.

Złe nawyki żywieniowe stanowią istotny czynnik prowadzący do rozwoju otyłości. Kształtują się one najczęściej w okresie wczesnego dzieciństwa i dużą rolę w tym procesie odgrywają rodzice. Dlatego najlepszą metodą dbania o prawidłowe nawyki żywieniowe swojego dziecka jest celebrowanie zdrowych zwyczajów na co dzień w domu.

SŁOWA KLUCZOWE: otyłość, dzieci, nawyki żywieniowe

Introduction

Obesity is an abnormal accumulation of body fat caused by the positive energy balance, which means that more energy is consumed than is expended during metabolism. The most popular method to assess whether the body mass is adequate is the body mass index (BMI) which is calculated from a person's weight and height. The BMI above 25 indicates the presence of overweight and BMI above 30 – obesity. The BMI for children is calculated the same way but the results cannot be interpreted according to the rules made for adults because of the differences in body composition which exist between children and adults. In order to assess whether the child's body mass is correct, BMI charts are widely used. Using such a chart, child's BMI can be compared to the typical values for other children of the same age. BMI that is above the 95th percentile points to the presence of obesity. Children with BMI between the 85th and 95th percentile are considered to be overweight.

Unfortunately, every year more and more children are overweight and obese. According to the report of the International Obesity Task Force, there are about 155 millions of overweight or obese school-aged children in the world [1]. In the 1990s in

Canada, Australia and some parts of Europe each year an additional 1% of the entire children population became overweight. The highest percentage of overweight children is in Americas (32%), while the lowest is in Africa (2%) [2]. In Europe 12-16% children aged 4-18 are overweight and 4-6% suffer from obesity, taken together 16-22% of European children have an excess body weight [1, 3]. In Poland in 2005 the prevalence of overweight and obesity among teenagers (13-15 years) was 12.5% and 1.9% respectively [4]. Unfortunately, the situation has been deteriorating through the years [5]. The excess body weight is a family problem as the prevalence of childhood overweight was the highest when both parents were overweight [6].

The medical consequences of obesity are well known. An excess of body fat accumulation usually leads to the development of hypertension, dyslipidemia and disturbed glucose metabolism which all together lead to the development of cardiovascular diseases. Moreover obese children are at higher risk of cholelithiasis, orthopedic complications, precocious puberty, dermatological problems such as stretch marks, as well as a variety of psychological issues such as low self esteem and depression. They are also at risk of developing type 2 diabetes as the impaired glucose tolerance was observed very early in obese children which signifies failing beta-cell function [7].

An excess body weight can be the consequence of genetic factors, endocrine disorders or certain drugs [8]. However, 'simple obesity' is the most common of them, which usually is due to the lack of physical activity and bad eating behaviours, which altogether lead to constant overfeeding. Consumption of foods rich in calories and sedentary lifestyle, cause positive energy balance and, as a consequence, lead to obesity. Lack of physical activity additionally reduces the basal metabolic rate as the fatty tissue uses much less energy than the muscles. Because of bad eating habits, children's diet is rich in calories, at the same time being deficient in elements necessary for proper development such as: vitamins, macro- and microelements, fibre and unsaturated fatty acids. The examples of such bad eating behaviours are: eating in front of the TV, snacking between meals, most often highly processed and calorie-rich foods, skipping breakfasts, drinking sugar-sweetened beverages, insufficient consumption of dairy products, "eating out" frequently and "emotional eating". Additionally, the growing body mass discourages children from any forms of physical activities such as playing games and physical education lessons. First of all such a child has problems with keeping pace with its peers and in addition it is ashamed of its physique. The more pleasant alternatives become long hours spent in front of the TV and the computer accompanied by favourite snacks. This way the excess of energy is consumed.

Eating in front of the TV screen

According to the report by Nielsen Company, American children aged 2-11 spent about 30 hours per week on average watching TV what accounts to more than 4 hours per day. The study of Francis et al. [9] showed that an average child spends 93% of their lunch time and 97% of the time during snacks in front of a TV screen. Watching TV while eating increases the amount of food consumed by a child, especially soft drinks, fried foods, and snacks [10]. Girls watching TV five or more hours per day consumed on average 175 kcal more than girls watching TV one hour or less [11]. The prevalence of obesity was also shown to be higher in a group of children who watched television for more hours per day [11]. It is possible that children who are given opportunities to eat while watching TV may become less sensitive to the internal satiety signals and thus continue eating throughout the whole TV programme.

Moreover, watching TV is an opportunity to follow all the advertisements of highly processed foods rich in fat and sugars [12], which are usually broadcasted during programs intended for children [13]. It has been proven that the children who are exposed to food advertisements are more likely to consume them [14]. Additionally, children who are eating while watching TV are less willing to eat fruits and vegetables [12].

As eating in front of the TV screen favours consuming high amount of calorie dense foods, it is advisable to eliminate this eating behaviour as a preventive strategy against the development of obesity.

Low frequency of meals

The majority of recent studies on the prevalence of obesity among children showed that the frequency of meals is inversely related to the presence of obesity in children but also in adults [15, 16]. In a research conducted by Toschke et al. [15] on 477 children aged 5-7, the prevalence of obesity decreased with the higher number of meals consumed during the day. In the group of children who ate 3 or less meals per day, 15% of children were overweight and 4.2% were obese. Among children who ate 5 or more meals per day, the prevalence of overweight and obesity was 8.1% and 1.7%, respectively. This could be due to an increased diet-induced thermogenesis in individuals who eat more frequently. Another explanation is associated with the number of meals consumed per day and the insulin metabolism. It has been proven that eating frequent meals, which are smaller in amount, cause smaller insulin secretion [17].

Skipping breakfasts

Skipping breakfast is regrettably one of most frequent improper eating behaviour. People who regularly skipped breakfast had 4.5 times higher risk of obesity than those who regularly ate breakfast [16]. The survey conducted during the sports camp in Italy showed the connection between skipping breakfast and the prevalence of overweight or obesity. Among children who admitted skipping breakfasts, 27.5% were overweight and 9.6% were obese. In the group of children who regularly ate breakfast 9.1% were overweight and 4.5% were obese [18]. Children usually skip breakfasts due to lack of time and not being hungry [18, 19]. Very often the lack of appetite in the morning is caused by eating a snack just before going to bed [18]. Consuming breakfast regularly has a positive influence on body mass as well as on child's concentration, memory and school achievements. Eating breakfast helps to stabilize the blood sugar levels, especially in the morning when the child is very active [18]. Moreover, both the presence of breakfast and type of breakfast influence serum lipids. It has been also shown that children and adolescents who skipped breakfast had higher levels of cholesterol compared to those who didn't. Participants who ate breakfast rich in fats (meat and eggs) had higher cholesterol level than those who ate breakfast rich in carbohydrates (cereals) [20].

Drinking sugar-sweetened beverages

According to the research conducted in the United States, during the last 20 years the amount of consumed carbohy-

drates, especially as monosaccharide (glucose and fructose) added to non-alcoholic beverages, raised concomitantly with the prevalence of obesity. Between 1977 and 1996 the contribution of energy derived from sweetened beverages raised from 13.1% to 16% of the whole energy intake. Moreover, according to "A Dietary Assessment of the U.S. Food Supply" between 1994 and 1996 more than 30% of carbohydrates in a diet of an average American derived from sugar added to beverages, while the World Health Organization recommends not to exceed the amount of 10% of monosaccharide in a daily diet. The energy intake from sweetened beverages increased 135% between 1977 and 2001. It is estimated that during this time in the US the daily amount of calories obtained from sugar-sweetened beverages raised by 83 kcal [21]. The great consumption of sugar-sweetened beverages is a very popular eating behaviour among children. Very often even babies are getting accustomed to drinking sweetened fruit juices. A lot of research point out the relationship between the consumption of sugar-sweetened beverages and positive energy balance leading to development of obesity. Almost 17000 children aged 9-14 were asked to note all the beverages consumed during a period of one year. There was a linear relationship between the consumption of sugar-added beverages and the weight gain, both in boys and girls. For instance, in a group of boys who drank one tin of sugar-sweetened beverage per day the BMI raised during one year by 3% while in the group of boys not drinking such beverages BMI remained stable [22]. Obese children consume more sugar-added beverages. The group of 91 obese children and 90 children with normal weight were asked for a dietary 24-hour history every few days. As it turned out, obese boys drank on average 8 portions of sugar-added beverages while their non-obese counterparts drank on average 4 portions of such beverages. Obese girls drank on average 7 portions daily in comparison to non-obese girls whose daily average consumption was 5 portions [23]. Solid carbohydrate is more filling and elicits dietary compensation, in contrast to liquid carbohydrates which are consumed additionally to other products [24, 25]. Wilson [26] proved that beverages consumed by children do not reduce the consumption of other foods. Some authors even claim that sugar-sweetened beverages increase the appetite making the food consumption even greater [27, 28]. Sugar-sweetened beverages deliver additional calories causing positive energy balance.

Eating out

Nowadays, little attention is paid to eating homemade meals. "Eating out" or ordering food became a very popular habit. The favourite foods which children eat outside of their homes is so called fast food – hamburgers, hot-dogs, pizzas. Such meals are most often high in calories, saturated fats and monosaccharides, at the same time they are scanty in nutrients needed for a proper development of a child-such as vitamins, unsaturated fats or fibre. For instance, the medium food package in one of the most famous fast food restaurants consisting of hamburger, medium portion of fries, medium coca-cola and portion of ice-cream with topping contains about 1200 kcal. It is half of the daily calories demand of a school-age boy, but does not consist much of the essential nutrients. Eating out very often leads to caloric overbalance and can contribute to development of obesity. In a research run by Gillis and Bar-Or [23] in the group of obese children 8 meals per month were eaten outside of home and children with a proper weight ate on average 5 meals per month outside of home.

Eating out is often connected with greater meat consumption and, as the consequence, higher amount of fat in the diet. In the Bogalusa Health Study, children whose 40% of daily calorie intake derived from fat consumed more meat than children who had fat intake of about 25-30% of their total calories [23]. Fat is very energy-dense in comparison to protein and carbohydrates and usually diets rich in fat are also rich in calories [29].

Apart from the fact that meals eaten outside of homes very often do not comply with the rules of rational nutrition, they are served in amounts, which exceed the recommended single portion, especially for children. In the last years, the portions of served meals have significantly increased [30]. The results of several studies have shown that increased portion size leads to a greater energy intake. Bigger portions are attractive because most often they are cost-effective. The restaurants usually offer bigger portions for the same price or an additional meal free of charge. Moreover, consumers who are used to greater servings do not realize that the portion they are having is much bigger than they should eat at a single meal [30]. The consequence is permanent overfeeding and positive energy balance. In order to check how the portion size influences the amount of consumed energy in children Rolls et al. [31] conducted a study where they served small, medium or large portion of starters to children before a main course. Children aged 4-6 years who were given bigger portion of a starter consumed more for the main course. Such relation was not seen in the group of children aged 2-3 years. Other authors suggest that the individual differences in the ability to control the amount of consumed energy are connected with body weight. In comparison to children with normal weight, obese children are more prone to eat more when they are offered a greater portion. In the group of obese children who were served a double portion of a starter led to a 25% increase of the energy consumed with a starter and lunch while in the group of non-obese children the consumed energy increased by 15% [32].

Concluding, regular eating outside of home can be connected with consuming greater portions and, as a consequence, positive energy balance which in turn leads to obesity.

Eating without hunger

The feeling of satiety is a physiological consequence of satisfying hunger and a factor, which promotes the end of consumption [33]. However, there are many external and internal factors that make the child continue eating or even begin eating even in the absence of hunger [34]. Such a behaviour can lead to obesity and very often is an eating habit among obese children.

It has been shown that overweight boys eat when they are not hungry much more often than non-overweight boys. The group of 52 boys aged 7-11 years were offered a variety of snacks after dinner. The overweight boys ate twice as much as their non-overweight counterparts [35]. In another similar experiment, 801 children aged 5-18 years were divided into two groups: obese and non-obese. Each child was offered a meal containing 50% of its daily energy demand. Subsequently, the child stayed for 10 minutes in a room filled with different games and toys and 10 snacks which it previously had pointed to be its favourite. The meal comprised on average 41% of daily energy demand and snacks eaten afterwards - 19%. Obese children ate 6.5% more of their total energy

demand that non-obese children (having regard to the fact that their total energy demand was higher). Moreover the amount of energy consumed as snacks was 19% higher comparing to their non-obese counterparts. It is worth to add that some children ate about 3160 kcal during 1-hour experiment. Boys ate 17% more snacks than girls. Moreover, the amount of snacks consumed during this experiment correlated with age and was calculated to be 44 kcal higher per each year [36]. This fact indicates that the problem of bad eating behaviour also increases with age.

Practical guidelines for parents and caregivers

Bad eating habits constitute an important risk factor for the development of obesity among children and adolescents. According to the psychological terminology, a habit is an automatic way of behaviour, which is learnt by repeating. Eating habits usually develop in early childhood. Parent's habits are an example for children and thus, the best way to take care of child's eating behaviours is to apply the rules of healthy eating on a daily basis at home.

Firstly, it is recommended to plan regular meals. The child should eat about five times a day. At least one meal a day must be eaten together with the other family members. Regularity of meals prevents an unexpected hunger and snacking between the meals. A special attention should be paid to eating breakfast before going to school which allows to keep the right sugar blood levels during morning hours when the child is very active. Eating breakfast also improves ability to concentrate, has an impact on memory and study results. Breakfast should constitute 20-30 % of the daily calorie intake and consist of dairy products, carbohydrates, plant fat and simple carbohydrates as an immediate source of energy.

As has been already mentioned, it is advisable to prevent uncontrolled snacking between the meals. The simplest way to accomplish that is to limit the access to sweets and other snacks. They should not be accessible in child's room. Some sweets can be served as a second breakfast or an afternoon snack but in a limited amount. Children must not eat in front of the TV or a computer screen.

Moreover, it is advisable to restrict the amount of sweetened beverages. They can be drank only occasionally. It is recommended not to accustom children to sweet beverages. Children should drink water, fruit teas and dairy beverages.

In spite of lack of time, every child should eat daily at least one hot meal containing all essential nutrients. Ideally is to eat a homemade meal but it can also be a meal eaten at school. When a child eats outside of home it is worth to check whether the meal is nourishing and prepared from fresh products. It is advisable to choose baked or cooked meat instead of fried. Moreover, such meal should contain vegetables and complex carbohydrates. It is recommended to drink water or freshly squeezed juice.

Eating under the influence of emotions like boredom, fear, anger or loneliness is a serious problem, that is often unnoticed or ignored. Also very often a child compensates a quarrel with peers, family differences or school problems by eating a favourite snack. This is a very worrisome habit leading to the development of nutritional disorders and obesity. Parents should pay attention when a child confuses hunger with other feelings and should not let it play with food. Moreover parents should not to substitute the lack of their time for their children with child's favourite sweets. Furthermore, children should not be overfed their appetite is the best indicator in telling them when they should stop eating.

It is really worth to pay attention to the child's eating habits because it will help to retain its health and proper body mass in the future. It is also important to remember that changing children's eating habits should be started from changing the habits of the all the family members first.

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