Sleep Structure in Depression, Schizophrenia, Psychosomatics, Borderline Syndrome and Anorexia Nervosa: A Comparison***

Astrid Thome*, Ulrich Köppen** (Munich)

Samples consisting of 10 patients out of each of the following diagnostic groups are compared to each other, as well as to a selected control group, with regard to their sleep polygram: narcisssistic depression resp. MDD, schizophrenia, psychosomatic and borderline disease and anorexia nervosa. The different and common aspects of the standard parameters of sleep (quantitative proportions of the sleep stages) and the parameters of structure (segmentation of time) are illustrated in a synopsis. Furthermore the authors attempt to compare the sleep structure of individual diseases with those of other diseases and with those of the selected control group in terms of delimitative entities. On the background of sleep sturctures, which also entails comparisons of ectreme groups with regard to the allocation of NREM 3 and the length of REM latency, the attempt is made to investigate how far aspects of sleep structure coincide with aspects of human-structure as described by Ammon, on the basis of his human-structural concept with respect to the various psychiatric diseases.

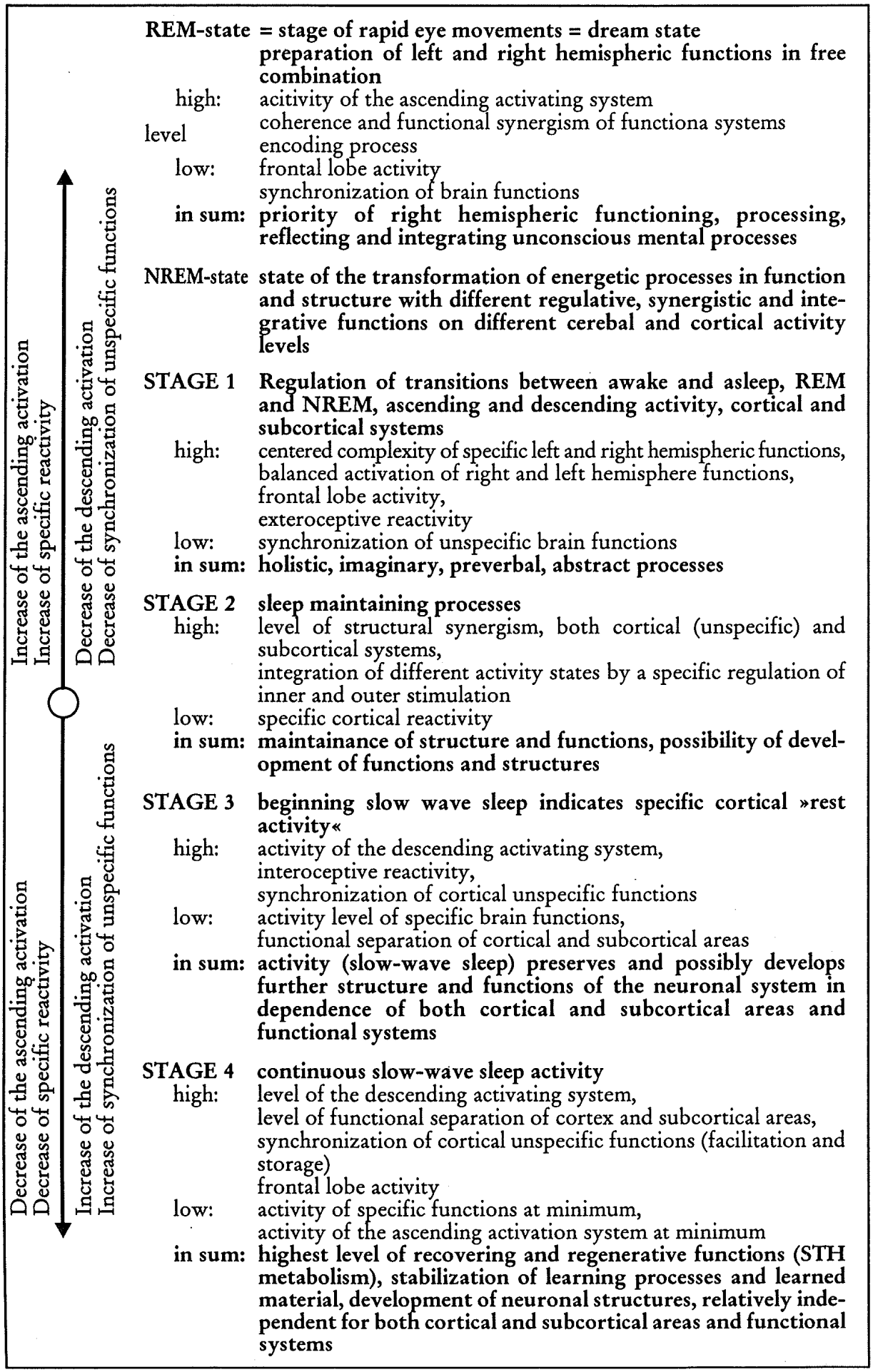
The sleep diagnostics of the Dynamic Psychiatry Hospital Menterschwaige is based on the human-structural concept of *Günter Ammon's* Dynamic Psychiatry. The theoretical principles are as follows:

1. The human-structural model assumes, that there is an interdependency between the three structural parts of personality: the central unconscious part, the primary biological part, and the part of behaviour functions. All parts of personality consist of several human functions. The unconscious core contains the main psychological functions like aggression, anxiety, ego demarcation, narcissism, sexuality etc. We assume an interdependency of biological functions as reflected in the sleep structure and those central unconscious functions.
2. Research results of the ontogenetic development of night sleep, current results of diagnostic sleep research of psychiatry, in literature, as well as results about the undergoing functions of the individual stages and states of sleep, are considered in the interpretations of the polygram (see table 1).
3. The interpretation of the polygram underlies the understanding of psychiatric disease, which *Ammon* terms »early archaic ego-diseases«. Characteristic of these diseases is a deficit in the central, unconscious core of personality which effects human functions such as aggression, anxiety, ego-demarcation, narcissism, ego-regulation etc. (*Ammon* 1976).

* M.A.,Clinical Psychologist, Psychoanalyst, Grouppsychotherapist, Dynamic Psychiatric Hospital Menterschwaige, Munich

** Psychiatrist, Dynamic Psychiatric Hospital Menterschwaige, Munich

*** Lecture given at the 10th World Congress of the World Association for Dynamic Psychiatry WADP/XXIII International Symposium of the Deutsche Akademie für Psychoanalyse (DAP), St. Petersburg, Russia, October 25–29, 1994



REM-state = **stage of rapid eye movements = dream state**
preparation of left and right hemispheric functions in free combination
high: acitivity of the ascending activating system
coherence and functional synergism of functiona systems
level
encoding process
low: frontal lobe activity
synchronization of brain functions
in sum: priority of right hemispheric functioning, processing, reflecting and integrating unconscious mental processes

NREM-state **state of the transformation of energetic processes in function and structure with different regulative, synergistic and integrative functions on different cerebal and cortical activity levels**

STAGE 1 **Regulation of transitions between awake and asleep, REM and NREM, ascending and descending activity, cortical and subcortical systems**
high: centered complexity of specific left and right hemispheric functions,
balanced activation of right and left hemisphere functions,
frontal lobe activity,
exteroceptive reactivity
low: synchronization of unspecific brain functions
in sum: holistic, imaginary, preverbal, abstract processes

STAGE 2 **sleep maintaining processes**
high: level of structural synergism, both cortical (unspecific) and subcortical systems,
integration of different activity states by a specific regulation of inner and outer stimulation
low: specific cortical reactivity
in sum: maintainance of structure and functions, possibility of development of functions and structures

STAGE 3 **beginning slow wave sleep indicates specific cortical »rest activity«**
high: activity of the descending activating system,
interoceptive reactivity,
synchronization of cortical unspecific functions
low: activity level of specific brain functions,
functional separation of cortical and subcortical areas
in sum: activity (slow-wave sleep) preserves and possibly develops further structure and functions of the neuronal system in dependence of both cortical and subcortical areas and functional systems

STAGE 4 **continuous slow-wave sleep activity**
high: level of the descending activating system,
level of functional separation of cortex and subcortical areas,
synchronization of cortical unspecific functions (facilitation and storage)
frontal lobe activity
low: activity of specific functions at minimum,
activity of the ascending activation system at minimum
in sum: highest level of recovering and regenerative functions (STH metabolism), stabilization of learning processes and learned material, development of neuronal structures, relatively independent for both cortical and subcortical areas and functional systems

Table 1: Parameters of sleep and their undergoing functions

All three principles are interconnected: The organisation and regulation of the individual human-structure determines the degree of healthy and ill parts in the individual. *Ammon* described severe psychiatric illnesses as »archaic ego diseases« (also as »archaic deficit«) (*Ammon* 1976) with deficits especially in the unconscious part of the personality.

The human-structural deficit, in order of the deficient functioning of regulation, is based in particular, on a weakness of demarcation capacities towards the outer and/or inner world, and on missing constructive functions.

For several years the aim of our sleep research has been to examine if patterns of night sleep reflect aspects of human structure as *Ammon* described. This poses the question: are there indicators in the polygram of night sleep, for instance the amount of stage 3, which allow conclusions about the organization and regulation of the individual human structure. The main work therefore was trying to isolate indicators, which differentiate severe psychiatric diseases according to their human-structural descriptions. The longterm goal of our sleep research is to validate the polygram as a diagnostic instrument, which together with other diagnostic instruments (e.g. psychological tests, case studies and direct observations of the therapeutic field) helps to differentiate between the various structural and functional parts of personality.

Our aim is not to diagnose in categories but, following *G. Ammon's* holistic approach, we seek for particularities as well as common structural aspects which could be measured by the polygram of night sleep. Thus we consider night sleep polygrams in the entire temporo-spatial context instead of isolated specific parameters.

The aim of this study is to investigate the discriminable sleep parameters of the following five diagnostic groups: depression (narcissistic depression = ND), schizophrenia (=S), psychosomatic diseases (=P), borderline personality disorder (=BP), anorexia nervosa (=AN) as against control subjects (C) and against each other.

Literature

Among a great number of publications on sleep research in psychiatry mainly comparisons of relatively small diagnostic groups could be found. Only few studies compare patients with different psychiatric disorders, and maximally three groups are compared (e.g. borderline disease with major depression, acute schizophrenia with chronic schizophrenia and control groups/ cf. *Benca* et al. 1982). Most publications aim at specific markers for a variety of diagnostic groups as anxiety disorders, schizophrenia, borderline syndrome, anorexia, bulimia and affective disorders. Until now the results are widely spread and not concordant. They show some indicators: the amount of delta sleep, REM sleep and their distribution, REM latency, eye movement, sleep efficiency etc.

The research work aims at specification of well known diagnostic categories and syndromes and formulation of new ones based on the night sleep polygram. The results are mostly comparable for defined settings and refer to field dependency. A recent meta-analysis of a great number of diagnostic sleep investigations shows common results only for affective illness due to the great number of studies to this category (cf. *Benca* at al. 1992).

Methods

The present study is the extension of previous studies (*Ammon* et al. 1985, 1989; *Burbiel* et al. 1991; *Thome, Köppen* 1992) and examines 51 patients of the Dynamic Psychiatric Hospital Menterschwaige. The diagnostic categorization follows human-structural viewpoints as well as ICD-diagnoses:

- narcissistic depression (F 33 ICD-10) (cf. *Burbiel* et al. 1992) (n=10)
- schizophrenia (F 20 ICD-10) (n=10)
- psychosomatic diseases (F 45 ICD–10) (n=10)
- borderline personality disorder (F 60.31 ICD-10) (n=11)
- anorexia nervosa (f 50.0 ICD-10) (n=10)

The control group contains n=10 subjects.

The patients underwent various diagnostic procedures:

- rating of experts based on detailed investigation of the patients' life history by psychoanalysts resp. psychiatrists, psychologists and social workers;
- psychological tests (ISTA*, MMPI; Gießen-Test);
- direct observations in the therapeutic field.

All patients had to be free of psychopharmacological medication for at least 14 days prior to the onset of the investigations. The control subjects performed the same test procedures and in addition a detailed interview about their life history (comp. *Thome, Köppen* 1992). They were matched to the patients' group.

Each patient slept in the sleep laboratory for two consecutive nights. The first night served to accomodate to laboratory conditions. The sleep polygraphic records made in the second night were evaluated to the standards of *Rechtschaffen* and *Kales* (1968). The groups were compared with respect to the standard parameters of sleep, which are sleep period time (SPT), the percental quote of sleep stages 1,2,3,4, awake and REM and also to structural parameters, which characterize the »architecture of sleep«, such as REM latency, the duration of REM phases and REM intervals.

The means and variance of the parameters were analysed by means of t-test resp. F-test. We compared each diagnostic group with the control group and all diagnostic groups against each other.

* Ego Structure Test according to Ammon

Results

In the following presentation we will show only some of the results (Tab. 2). A comparison of the means of the standard parameters of night sleep shows an increased activity level of sleep for the examined diagnostic groups except of the group of anorexia nervosa. The slow wave sleep is reduced in the diagnostic groups of ND, S, P and BP. There is a significantly decreased amount of the stages 3 and 4 in schizophrenic and borderline patients, and of stage 3 in depressive and psychosomatic patients as against the control group. In literature such results are sonsistently confirmed only for affective disorders (cf. *Benca* at al. 1992).

		C (n=10)		ND (n=10)		Signifikanz-niveau		S (n=10)		Signifikanz-niveau	
		$\bar{x}$	s	$\bar{x}$	s	Var.	Mean	$\bar{x}$	s	Var.	Mean
SPT		402.30	65.75	466.77	45.97		.020	438.57	70.10		
Awake	%	2.17	2.43	5.48	7.35	.004		3.27	4.01		
Stage 1	%	15.82	2.76	18.02	4.78			19.78	4.18		.021
Stage 2	%	51.97	4.66	55.00	10.62	.024		57.88	5.16		.015
Stage 3	%	9.63	3.98	3.52	4.84		.006	4.02	4.75		.010
Stage 4	%	2.13	2.29	0.70	1.48			0.08	0.23	.000	.019
REM	%	18.29	4.99	17.28	4.93			14.99	3.88		

		P (n=10)		Signifikanz-niveau		BD (n=11)		Signifikanz-niveau		AN (n=10)			
		$\bar{x}$	s	Var.	Mean	$\bar{x}$	s	Var.	Mean	$\bar{x}$	s	Var.	Mean
SPT		455.27	38.96		.040	451.46	49.27			391.37	53.59		
Awake	%	3.81	7.18	.004		5.91	6.87	.004		7.83	7.43	.004	.041
Stage 1	%	15.85	3.89			15.38	5.87	.034		17.62	6.30	.022	
Stage 2	%	58.07	6.33		.024	52.34	5.56			48.42	7.64		
Stage 3	%	3.55	5.76		.013	5.37	4.64		.035	8.06	6.46		
Stage 4	%	0.50	1.48		.072	0.13	0.27	.000	.021	2.28	3.81		
REM	%	18.24	4.22			20.87	6.10			15.79	4.40		

Table 2: Night Sleep EEG Measures (Standard parameter/ Mean + Variance) of Depressive (ND), Schizophrenic (S), Psychosomatic (P), Borderline (BP), and Anorexia Nervosa (AN) Patients compared with Control Subjects (C); s = Standard Deviation

In our research study only the anorexia nervosa group shows the same amount of stage 3 and 4 as the control group.

The reduction of slow wave sleep goes along with an increased amount of sleep stages with higher vigility: the schizophrenics show a significant increase of stage 1 and 2, the psychosomatics of stage 2.

The borderline group has the highest amount of REM sleep on a significant level as compared with the anorexia and the schizophrenia group. The anorexia nervosa shows the highest amount of awake during sleep group on a significant level as against the control group.

The sleep period time in all groups of patients except the anorexia nevosa group is prolonged as against the control group, at a significant level in the groups of ND and P.

In comparing the parameters indicating the structure of night sleep we found the following interesting results: the REM latency is neither reduced in the patients' group in general nor in the depressive group, as one would expect. In individual cases there are reduced REM latencies throughout the group. The distribution is particularly widespread in the depressive patients, marked by a significantly greater variance as against the control group.

In the group of the schizophrenic patients the first REM phase is reduced as against the other groups, and the subsequent NREM interval is prolonged as against depressive and psychosomatic patients and control subjects. The third REM phase is significantly reduced in depressive and schizophrenic patients as against borderline and anorectic patients.

The length of the fourth NREM interval is significantly higher in the schizophrenic group than in the psychosomatic group, borderline group and control group.

The number of REM phases is significantly higher in the borderline group as against the anorexia nervosa and control group.

Interpretation

Altogether, the results show for the average of all patients, an increased activity level of night sleep (except of the group of anorexia nervosa). This raised level of activation shows a deficient functioning of the regulative systems of ascending and descending activation. Sleep structure is the functional reflection of the activity of an active-adaptive-regulative system (*Koella* 1988). The sleep process as opposed to the waking state is but another functional state of the same functional system, namely the brain. In particular in the area of schizophrenia with positive symptoms, neurophysiological research has shown a psycho-physiological hyper-arousibility (e.g. *Wiebel* 1995). For this hyper-arousibility, a deficiency in the ability to modulate is considered to be the responsible factor, i.e. a deficient functioning of complex, regulative neurological systems.

It is particulary noteworthy that four diagnostic groups show a raised activity level during night sleep, which of course is displayed in varying indicators among the groups. It may be possible to draw a parallel between this functional deficit on the basis of night sleep and *Ammon*'s phenomenological definition of an »archaic deficit« (*Ammon* 1976), similar to all severe psychiatric diseases in spite of all differences (*Ammon* et al. 1985, 1989). A deficit in regulative functions such as outer and inner demarcation, autonomy and narcissism is considered to cause this deficit. Due to this lack ofregulative functions, anxiety and aggression cannot be sufficiently structured and channelled (*Ammon* et al. 1985, 1989).

From this standpoint the schizophrenic group shows the largest structural and functional deficit. This is indicated by the highest degree of disregulation and the highest activation of night sleep similar to the borderline group. In addition, the cyclic structure of night sleep is altogether disturbed by a shortened first and, as against borderline and anorectic patients, reduced third REM phase and the prolongation of the second and fourth NREM intervals. The deficit in the borderline group is not as marked as in the schizophrenic group, due to the former's possibility for compensation by the higher amount of REM sleep on a high functional level (*Ammon* et al. 1989).

The results of an increased REM sleep and decreased delta or slow wave sleep is – to a large extent – also reported for depression (*Benca* at al. 1992): This fact has led to different concepts: REM sleep is increased by means of an increased REM pressure, decreased REM suppression or a lower REM level (*Vogel* 1979, *Gillin* 1985, *Benca* et al. 1992). The »two-process-model of sleep regulation (*Borbely* 1989 – aput *Benca* et al. 1992) assumes a deficiency in NREM pressure, whereas the phase-advanced theory assumes an irregularity in circadian rhythms. In any case REM sleep and NREM sleep are considered as antagonisms. Our assumption is the effect of compensatoric principles. In our view, the regulatory deficit, which is particularly expressed in a decrease of NREM sleep stage 4, is compensated by an increase of REM sleep, respectively compensated on an earlier ontogenetic level of night sleep meaning an arrest on an earlier ontogenetic level (*Roffwarg* 1966).

If there is no possibility of compensation by REM sleep as in acute psychotic states (*Julien* et al. 1980) and in so-called anxiety disorders (*Benca* et al. 1992), this leads to an increase in the sleep stages 1 and 2, regulating transition (see table. 1).

The results show in psychosomatic and depressive patients a prolonged sleep period time. One can assume that concerning sleep insufficiency a compensation takes place by this prolongation.

Compared to the other diagnostic groups, the anorectic group shows a highly defined polarity concerning the standard parameters of the night sleep polygram (largest amount of stage 3 and 4 NREM activity and longest periods of being awake accompanied by lowest values regarding REM and stage 2 NREM sleep). We assume that these relations reflect a disfunctional regulation of increasing and decreasing activation during night sleep. This promotes the cortical activation and reduces the activity of functions related to synergetic effects of the brain hemispheres. This disfunctional regulation corresponds with a rigid demarcation from the individual unconsious as well as from the giving and taking of social energy (*Ammon* 1982b) within the surrounding group(s).

	Group B (n = 40)		Signifikanz-niveau		Group A (n = 11)	
	$\bar{x}$	s	Var./Mean		$\bar{x}$	s
SPT	439.28	57.48			446.79	56.82
Awake %	5.68	6.79			3.80	6.07
Stage 1 %	18.09	5.16		.032	14.39	4.14
Stage 2 %	55.58	7.57		.024	49.65	7.58
Stage 3 %	2.49	2.86		.000	13.70	2.20
Stage 4 %	0.40	2.03		.027	1.90	1.55
REM %	17.76	4.75			16.56	6.24

	Group C (n = 40)		Signifikanz-niveau		Group A (n = 11)	
	$\bar{x}$	s	Var./Mean		$\bar{x}$	s
SPT	402.30	65.75			446.79	56.82
Awake %	2.17	2.43	.012		3.80	6.07
Stage 1 %	15.82	2.76			14.39	4.14
Stage 2 %	51.97	4.66			49.65	7.58
Stage 3 %	9.63	3.98		.008	13.70	2.20
Stage 4 %	2.13	2.29			1.90	1.55
REM %	18.29	4.99			16.56	6.24

	Group C (n = 40)		Signifikanz-niveau		Group B (n = 11)	
	$\bar{x}$	s	Var./Mean		$\bar{x}$	s
SPT	402.30	65.75			439.28	57.48
Awake %	2.17	2.43	.002	.001	5.68	6.79
Stage 1 %	15.82	2.76	.040		18.09	5.16
Stage 2 %	51.97	4.66			55.58	7.57
Stage 3 %	9.63	3.98		.000	2.49	2.86
Stage 4 %	2.13	2.29		.022	0.40	2.03
REM %	18.29	4.99			17.76	4.75

Table 3: Comparison of Mean ($\bar{x}$) and Variance (Var.) between patients with increased stage 3 (Group B) and patients with decreased stage 4 (Group A) and Control Subjects (Group C)

Within all groups of patients there are two extreme positions: patients with high activated sleep (Group B; n=40) and a subgroub (Group A; n=11) of patients with a high amount of stage 3 NREM sleep (see table. 3). This subgroup consists of patients of all five diagnostic groups, but mostly affected is the group of anorexia nervosa. In reference to the group with a high amount of stage 3, we can say that the pattern of this slow wave sleep shows an unripe EEG feature (alpha-delta-sleep). In addition REM sleep tends to be reduced. At the same time it is these patients who phenomenologically display a large development deficiency. They in particular have a rigid inner and outer demarcation, they avoid anxiety concerning relationships and concerning demands of reality, and show a large resistance to therapy. Their deficits are less obvious as can be observed in the group with the drastically reduced slow wave sleep. Those patients (with the higher amount of stage 3) can hardly be reached in the verbally oriented forms of psychotherapy, as used in the two-person standard situation or in group psychotherapy.

Insofar as schizophrenic patients are concerned, they show negative symptoms. It can be assumed, that this particular picture reflects structural stagnation.

Some considerations concerning an integral phenomenology of deficient and disregulative factors of night sleep in the sample of all patients

In a simple way we related the results concerning the deficits in the sleep structure of the different diagnostic groups (ND, S, P / *Ammon* et al. 1985) to the psychological construct of an »archaic deficit«, which is common to all severe psychiatric disorders (*Ammon* 1976). Even the biological sleep research concedes the existence of indicators in the biological part of the personality which contradict the common psychiatric categorization; so *Benca* et al. (1992) pointed out that depressive patients with acute psychotic exacerbation are more similar in their sleep profile to other acute psychotic patients than to depressive non-psychotic patients.

Our results of the last years allow an increasingly specific view of the deficient and disregulative factors in the polysomnographic features in severe psychiatric disorders. Here we only wish to outline some possible explanations.

The deficit in sleep can be shaped in two different main directions, one towards the destruction of sleep through the increase of activity, the other towards an increased desactivation. The highest activity level of night sleep is shown by the group of schizophrenic patients, preventing more or less the establishment of the slow wave stages 3 and 4, shortening the REM phases of the first part of the night. We assume that even more reduced REM sleep like in schizophrenia and in particular in acute psychosis is caused by stronger disregulative forces, such as a larger amount of destructive anxiety compared with the other diagnostic groups.

In an extensive study *Ernest Hartmann* (1982) demonstrates the complex connection between the catecholamine system, dreams and the psychological construct of »unneutralized energy«. He interprets disturbances in the metabolic processes of catecholamine system, which influences the dream process, as rooted in »unneutralized energy«. We would understand this ego-psychological explanation as dysfunctional amounts of anxiety and/or aggression (*Ammon* 1979). *Hartmann* assumes, that these metabolic systems are essential for the regulation of higher functions of the CNS. The REM process is characterized by an increased effectiveness of dopamine and a decreased or even missing influence of norepinephrine and seretounine. Norepinephrine plays a role on planned and purposeful action, it is assumed that seretonine has an arousal dampening function. In healthy persons additional doses of dopamine increase the vividness of dreaming. Dopamine blockers are used to relieve schizophrenic productive symptoms.

Rotenberg (1990) establishes a connection between search activity – a psychological construct, which corresponds to *Ammon's* »constructive aggression« – and a balanced activation of the catecholamine circle, that means set-up and consumption. Acute stress is accompanied by an increase of norepinephrine in the brain, the extension of stress in panic uses too much epinephrine and prevents the sufficient rebuilding. The lower level caused by panic is corresponding to secondary depression. In the case of deficiency of search activity this circle is not at all inititated, the catecholamine system having a basically low level.

In our view there are physiological correspondences with the psychological constructs of *Ammon's* dynamic human functions of anxiety and aggression in the constructive, destructive and deficient qualities. The balanced, over-active and not initiated activation of the catelocholamine system may represent an equivalent of this psychological concept. The extent of deficient psychic demarcation has to be considered with the amount of pharmacological blocker, given to balance metabolic systems.

The depressive factor of all these diseases might be shown in a shortened REM latency in spite of the variety of results. We interpreted this marker as a sign of outer deficient demarcation of depressive persons (*Ammon* et al. 1989). They withdraw from their environment in an introverted act, they go too early and for a longer period into the inner-stimulative possibilities of the REM process. This is a reaction against the environment which is experienced as hostile.

When the depressive person does not avoid any longer the experience of his deep anxiety, we assume a prolonging of the REM latency. Anxiety to a disfunctional extent is destructive anxiety, it puts the process of the catecholamine system leading to exhaustion which leads to depression into operation. *Ammon* comprehends this anxiety in its roots as anxiety of abandonment, which had not received sufficient demarcation in the early childhood. The main force underlying the psychotic reaction is destructive

anxiety, but not unneutralized, aggressive energy, as mentioned by *Heinz* and *Ernest Hartmann*, the aggression is assumed as being secondary. During sleep destructive anxiety affects REM sleep and increases the activity level. This increase of activation with the greatest extension in schizophrenia probably has a connection with the experience of separation, i.e. separation from the primary group and from symbiosis. During all deep separation processes the human functions are mobilized, but no new integrative factors have been found. In this respect the archaic ego diseases can be also understood as a longlasting state of crisis which occurs only temporarily in healthy persons (cf. the reduction of slow wave sleep during pregnancy, *Brunner* et al. 1994).

In this view it is not surprising that there is no reduction of slow wave sleep in dementia (*Benca* at al. 1992). We present the results of a reduction of the activity level in the sub-group of high-delta patients. We think that for any syndrome (or kind of illness) one outcome criterion must be the reduction of a basically increased level of activation during sleep.

We emphasized that all these compensatory mechanisms, i.e. more slow-wave sleep or more REM sleep, do not show maturely developed features.

Rotenberg (1990, 1992) compares the different studies on the influence of sleep deprivation on retention and on recall of new information. He concludes that retention of learned material depends on phases of rapid eye movements connected with slow wave sleep, whereas tonic components of REM sleep have a negative effect on retention. Therefore he suggests »that the explanation of the REM sleep effect on memory as a psychic function must be based on the psychological function of dreams« (*Rotenberg* 1992).

In this context it is interesting that patients who consider their psychotherapy as successful (after termination of psychotherapy) have more direct and vivid feelings in their dreams, as *Melstroem* and *Cartwright* could demonstrate in their investigations (1983).

Schlafstruktur bei Depression, Schizophrenie, Psychosomatik, Borderline-Syndrom und Anorexia Nervosa: ein Vergleich

Astrid Thome, Ulrich Köppen (München)

Die Schlafdiagnostik in der Dynamisch-Psychiatrischen Klinik Menterschwaige beruht auf den theoretischen Prinzipien von *Günter Ammon's* Humanstrukturkonzept:

1. Eine Interdependenz zwischen den drei Stukturanteilen der Persönlichkeit – primären biologischen, zentralen unbewußten und sekundären Anteilen des Verhaltens – wird angenommen. Der unbewußte Kern umfaßt die grundlegenden psychischen Funktionen wie Aggression, Angst, Ich-Abgrenzung, Narzißmus und Sexualität. Die drei Strukturanteile der Persönlichkeit sind miteinander verflochten und ineinander reflektiert (*Ammon* 1979).

2. In die Interpretation der Nachtschlaf-Polygramme gehen Forschungsergebnisse der ontogenetischen Schlafentwicklung, der Schlafforschung und der zugrundeliegenden Funktionen ein.
3. Weiter liegt der Interpretation *Ammons* Verständnis von psychiatrischen Erkrankungen als »archaischen Ich-Krankheiten« (*Ammon* 1976) zugrunde. Es sollen vor allem Indikatoren herausgefunden werden, die schwere psychiatrische Krankheiten differenzieren entsprechend ihrer humanstrukturellen Beschreibung.

In dieser Studie, die auf vorhergehenden aufbaut, untersuchen die Autoren, welche Parameter des Nachtschlafpolygramms sich bei folgenden Diagnosegruppen unterscheiden: narzißtische Depression (ND; n=10) Schizophrenie (S; n=10), psychosomatische Erkrankung (P; n=10), Borderline-Persönlichkeits-Störung (BP; n=11), Anorexia nervosa (AN; n=10). Sie werden sowohl untereinander als auch jeweils mit einer gesunden Kontrollgruppe (C; n=10) verglichen. Die untersuchten 51 Patienten der Dynamisch-Psychiatrischen Klinik Menterschwaige waren zuvor mindestens 14 Tage psychopharmakafrei; sie hatten umfangreiche diagnostische Verfahren zu absolvieren, ebenso die Kontrollgruppe, bei der zusätzlich ein detailliertes Interview zur Lebensgeschichte erhoben wurde (vgl. *Thome, Köppen* 1992).

Jeder Patient schlief zwei aufeinanderfolgende Nächte im Schlaflabor. Die Evaluation der Schlafpolygramme der zweiten Nacht erfolgte nach den Standards von *Rechtschaffen* und *Kales* (1968) in den Variablen Schlafperiodenzeit (SPT); Prozentquote der Schlafstadien 1, 2, 3, 4, Wach und REM, REM-Latenz, REM-Dauer und REM-Intervalle. Die statistische Analyse erfolgte mit t- bzw. F-Test.

Mit Ausnahme der AN-Patienten zeigen alle Diagnosegruppen ein erhöhtes Aktivitätsniveau; Schlafstadium 3 und 4 ist signifikant reduziert bei S und BP, Stadium 3 bei ND und P. Die Verminderung der langsamen Schlafwellen geht einher mit signifikanter Erhöhung der Schlafstadien höherer Vigilität (Stadium 1 und 2 bei S, Stadium 2 bei P).

Die BP-Gruppe hat den höchsten Anteil an REM-Schlaf, signifikant höher als AN und S. Verglichen mit der Kontrollgruppe zeigen die AN-Patienten einen signifikant höheren Wachanteil, den höchsten aller Gruppen insgesamt. SPT ist bei allen Patientengruppen außer AN verlängert gegenüber der Kontrollgruppe, signifikant bei ND und P.

Hinsichtlich der Schlafstruktur fanden sich folgende Resultate: Die REM-Latenz ist entgegen den Erwartungen weder allgemein bei den Patientengruppen noch bei der ND-Gruppe speziell reduziert. Bei den S-Patienten ist die 1. REM-Phase reduziert, das folgende REM-Intervall istverlängert. Die 3. REM-Phase ist bei ND und S signifikant reduziert verglichen mit BP und AN. Das 4. REM-Intervall ist signifikant länger bei S als bei P, BP und C. Bei BP ist die Zahl der REM-Phasen signifikant erhöht gegenüber AN und C.

Die Autoren verstehen das erhöhte Aktivitätsniveau der Patientengruppen als Defizit der Aktivationsregulation. Dies könnte als Analogon zum

psychologischen Begriff des »archaischen Ich-Defizits« (*Ammon* 1979) aufgefaßt werden. Das größte strukturelle Defizit in diesem Sinne ist bei der S-Gruppe zu beobachten. Bei den Borderline-Patienten zeigt sich ihre größere Kompensationsfähigkeit im höheren Anteil an REM-Schlaf (*Ammon* et al. 1989).

Als mögliche Ursache dafür nehmen die Autoren an, daß das Regulationsdefizit (ausgedrückt in Verringerung von NREM-Stadium 4) durch den vermehrten Anteil an REM-Schlaf kompensiert wird. Auch die Verlängerung der Schlafperiodenzeit (SPT) bei Psychosomatik und narzißtischer Depression verstehen sie als Kompensation.

Die auffallenden Ergebnisse bei AN werden mit einer dysfunktionalen Aktivationsregulation erklärt, die mit starrer Abgrenzung gegenüber dem eigenen Unbewußten wie gegenüber sozialenergetischem Austausch korrespondiert.

Über alle Diagnosegruppen hinweg gibt es zwei Extrempositionen: 40 Patienten mit hochaktiviertem Schlaf und 11 Patienten mit einem hohen Anteil von Stadium 3-NREM-Schlaf (Tab. 3), zu denen vor allem AN-Patienten gehören. Nach Meinung der Autoren spiegelt dies ein Moment der strukturellen Stagnation wider. Gemeinsam ist all diesen Patienten, daß sie in rein sprachgebundenen Psychotherapieformen kaum erreicht werden können.

Das Defizit im Schlaf kann prinzipiell in zwei verschiedenen Richtungen auftreten: als Anwachsen der Aktivation oder als erhöhte Desaktivierung. Das höchste Aktivitätsniveau im Schlaf weisen S-Patienten auf, dadurch werden die Stadien 3 und 4 nahezu verhindert und der REM-Schlaf der ersten Nachthälfte reduziert. Bei akuter Psychose ist der REM-Schlaf weiter reduziert. Die Autoren postulieren unter Rückgriff auf *Ernest Hartmann* (1982) einen Zusammenhang zwischen metabolischen Prozessen (Katecholamin, Norepinephrin, Dopamin), den Träumen und »unneutralisierten Energie« (*Heinz Hartmann).*

Konstruktive Aggression, wie *Ammon* sie versteht, entspricht der Suchaktivität, die *Rotenberg* (1990) beschreibt. Sie ist bei Depression reduziert. Der depressive Faktor bei den hier untersuchten Krankheiten könnte sich in der verkürzten REM-Latenz zeigen als Ausdruck eines aktiven Rückzugs von der als feindlich erlebten Umwelt. Angst in dysfunktionalem Ausmaß ist destruktive Angst, sie aktiviert das Katecholamin-System, das zu Erschöpfung und Depression führt. Nach *Ammon* hat die Depression ihre Wurzel in tiefer Verlassenheitsangst. Destruktive Angst liegt der psychotischen Reaktion zugrunde, sie beeinträchtigt den REM-Schlaf und erhöht das Aktivitätsniveau.

Bei sogenannten »Hoch-Delta-Patienten« herrschen langsame Schlafwellen vor. Sowohl vermehrten REM-Schlaf wie vermehrte langsame Wellen verstehen wir als nicht ausreichende Reifung.

Deshalb müßte für alle psychischen Erkrankungen ein wesentliches Kriterium des Therapieerfolgs die Normalisierung des Aktivationsniveaus

im Nachtschlaf sein. *Rotenberg* (1990, 1992) weist auf Zusammenhänge zwischen REM-Schlaf, langsamen Wellen und dem Behalten von Lerninhalten hin. Er betont die psychologische Funktion der Träume für das Behalten neuer Information.

Patienten, die ihre abgeschlossene Psychotherapie selbst als erfolgreich einschätzen, berichten denn auch direktere und lebhaftere Gefühle in ihren Träumen (*Melstroem, Cartwright* 1983).

References

Ammon, G. (1972): Über die psychodynamische Beziehung von Traum, Psychose und Realität in der Schizophrenie unter dem Aspekt der Ich-Regulation. In: Psychother. Psychosom. (20) 366–378
- (1978): Das Verständnis eines Entwicklungsdefizits von Ich-Strukturen in Persönlichkeit und umgebender Gruppe für Wissenschaft und Praxis einer Dynamischen Psychiatrie. In: Dyn. Psychiat. (11) 120–139
- (1979): Entwurf eines Dynamisch-Psychiatrischen Ich-Strukturkonzepts. In: *Ammon, G.* (Hrsg.): Handbuch der Dynamischen Psychiatrie Bd. 1 (München: Ernst Reinhardt) 95–159
- (1982a): Hirnstrukturen, Unbewußtes und Ich-Strukturologie. In: *Ammon, G.* (Hrsg.): Handbuch der Dynamischen Psychiatrie Bd. 2 (München: Ernst Reinhardt) 89–123
- (1982b): Das sozialenergetische Prinzip in der Dynamischen Psychiatrie. In: ebd. 4–25

Ammon, G.; Köppen, U.; Hoffsten, M. (1985): Neue Ansätze zu einem Verständnis von Schlafprofilen unter ontogenetischen Aspekten – eine Pilot-Study aus der humanstrukturologischen Schlafforschung. In: Dyn. Psychiat. (18) 111–133, 175–201

Ammon, G.; Burbiel, I.; Köppen, U.; Hoffsten, M. (1987): Die Organisation der Ruhe- und Aktivitätsprozesse und deren Integration als Indikator für die Entwicklung des Menschen im therapeutischen Prozeß. In: Dyn. Psychiat. (20) 24–41

Ammon, G.; Köppen, U.; Thome, A.; Tiedge, W. (1988): Indikatoren im Nachtschlaf als Kriterien für nachholende Entwicklung im Verlauf psychotherapeutischer Behandlung. In: Dyn. Psychiat. (21) 253–280

Ammon, G.; Köppen, U.; Stein. G.; Thome, A.; Tiedge, W. (1989): Schlafuntersuchungen mit Borderline-Patienten im Vergleich zu Gruppen mit Depression, Schizophrenie und Psychosomatik. In: Dyn. Psychiat. (22) 253–275

Arriga, F.; Rosado, P.; Paiva, T. (1990): Clinical correlations of EEG sleep disturbances in anxiety and depression. In: *Horne, J.A.* (ed.): Sleep '90 Proceedings of the 10th European Congress on Sleep Research (Bochum: Pontenagel Press)

Benca, R.M.; Obermeyer, W.H.; Thisted, R.A.; Gillin, J.C. (1992): Sleep and psychiatric disorders. A meta-analysis. In: Arch. Gen. Psychiatry (49) 651–668

Brunner, D.P.; Münch, M.; Biedermann, K.; Huch, R.; Huch, A.; Borbely, A.A. (1994): Changes in sleep and sleep electroencephalogram during pregnancy In: Sleep (17) 576–582

Burbiel, I.; Köppen, U.; Thome, A. (1991): Schlafuntersuchungen bei Patienten mti Anorexia Nervosa im Vergleich zu Patienten anderer humanstruktureller Diagnosegruppen. In: Dyn. Psychiat. (24) 34–55

Burbiel, I.; Apfelthaler, R.; Fabian, E.; Schanné, U.; Wolfrum, G. (1992): Stationäre Psychotherapie der Psychosen – eine testpsychologische Untersuchung. In: Dyn. Psychiat. (25) 214–276

Cartwright, R.D. (1991): Dreams that work. The relation of dream incorporation to adaptation to stressful events. In: Dreaming (1) 3–9

Hartmann, E. (1982): From the biology of dreaming to the biology of the mind. In: The Psychoanalytic Study of the Child (37) 303–335

Julien, R.; Balzamo, E.; Defour, H.; Bert, J. (1980): Sommeil de nuit des psychoses aigues et chroniques. In: L'Encéphale (VI) 371-380

Koella, W.P. (1988): Die Physiologie des Schlafes – eine Einführung. (Stuttgart, New York: G. Fischer)

Lauer, C.J.; Garcia-Borreguero, D.; Pollmächer, T., Özdagla, A.; Krieg, J.C. (1990): Allnight EEG sleep in anxiety disorders and major depression. In: Sleep '90, Proceedings of the 10th European Congress on Sleep Research (Bochum; Pontenagel Press)

Melstroem, M.A.; Cartwright, R.D. (1983): Effects of sucessful and unsucessful psychotherapy outcome on some dream dimensions. In: Psychiatry (46) 51–63

Rechtschaffen, A.; Kales, A. (eds.) (1968): A manual of standardized terminology, technics and scoring system for sleep stages of human subjects. In: Public Health Service, U.S. Government Printing Office, Washington, D.C.

Reynolds III; C.F.; Kupfer, D.J. (1987): Sleep research in affective illness: State of the art circa 1987. In: Sleep (10) 199–215

Riemann, D.; Hohagen, F.; Fleckenstein, P.; Olbrich, R.; Berger, M. (1990): Schlaf und Schizophrenie: Der Einfluß cholinerger Stimulation mit RS 86 auf die Schlafstruktur schizophrener Patienten im Vergleich zu gesunden Kontrollpersonen, depressiven Patienten und Patienten mit Angsterkrankungen. In: *Möller, H.J.; Pelzer, E.* (Hrsg.) Neuere Ansätze zur Diagnostik und Therapie schizophrener Minussymptomatik, Springer Verlag

Roffwarg, H.P.; Muzio, J.N.; Dement, W.C. (1966): Ontogenetic development of human sleepdream cycle. In: Science (152) 604–619

Rotenberg, V.S. (1990): Anxiety, panicky behaviour and depression. A psycho-behavioral and biological Approach. In: Dyn. Psychiat. (23) 302–309

– (1992): Sleep and memory I: The influence of different sleep stages on memory. In: Neuroscience and Biobehavioral Reviews (16) 497–502

– (1992): Sleep and memory II: Investigations on humans. In: Neuroscience and Biobehavioral Reviews (16) 503–505

Rotenberg, V.S.; Arshavsky, V.V. (1984): Search activity and adaption. In: (Moskau: »Nauka« Publishers)

Thome, A.; Köppen, U. (1992): Vergleich des Nachschlafpolygramms einer Gruppe schizophren strukturierter Patienten mit einer selektierten Kontrollgruppe. In: Dyn. Psychiat. (25) 316–331

Zarcone, V.P.; Benson, K.L.; Berger, P.A.(1987): Abnormal rapid eye movement latencies in schizophrenia. In: Arch. Gen. Psychiatry (44) 45–48

Adresses of the authors:

Dipl. Psych. Astrid Thome
Lindwurmstraße 95A
D-80337 München

Ulrich Köppen
St.-Martin-Straße 38
D-81541 München