

To a question of optimization of young men inspection at psychiatric examination

Abstract

In article an attempt of optimization of psychiatric inspection of young men with use of the neurophysiological changes revealed by means of a new technique – dispersions of amplitude-frequency characteristics of an alpha rhythm (DAFCAR)-for the purpose of identification of the general regularities of development of psychopathology, creation of natural-science systematization of mental diseases on the basis of dimensional neurophysiological methods is made.

Keywords: frustration of the personality, intellectual backwardness, differential psychiatric diagnostics

Volume 2 Issue 5 - 2018

Rosman SV, Maximova NE

Physician of Functional Diagnostics of SBIH, Head of the Department of Psychiatry of the SBEI Tver State Medical University of the Ministry of Health of Russia, Russia

Correspondence: Rosman SV, Physician of Functional Diagnostics of SBIH, Regional Psychoneurological Clinic, Tver, Russian Federation, Russia, Tel +7903 8001 105, Email seros2005@mail.ru

Received: July 27, 2018 | **Published:** September 18, 2018

Abbreviations: DSch, debut of paranoid schizophrenia (F20.09x ICD-10); MMR, Mild Mental retardation (F70.x ICD-10); PD, Personality disorder (F60.x ICD-10); DAFCAR, Dispersion of Amplitude-Frequency Characteristics of the alpha rhythm EEG; NGNB, Neuron-Glial Network of the brain; CDa1, Coefficient of Dispersion of alpha-Rhythm EEG-1 (the quotient of the modal values of power of alpha rhythm to his total power in the range of 7-13 Hz); CDa2, Coefficient of Dispersion of the alpha-Rhythm EEG-2 (the quotient of the power of the alpha rhythm in the range of “a modal value ± 0.5 Hz” to his total power in the range of 7-13 Hz); MoFO, Value of the Modal Frequencies in Occipital Electrodes; MoFF, Value of the Modal Frequencies in Frontal Electrodes; MoFO - MoFF, Value of the Difference of Modal Frequencies Between the Occipital and Frontal Electrodes; IIDA, Integral Index of Dispersion of the Alpha rhythm EEG (Value of the Kurtosis of the Normal Distribution CDa1 in the Occipital Electrodes); ADA, Asymmetry Distribution of the Alpha rhythm EEG (Value of the Asymmetry Distribution CDa1 in the Occipital Electrodes); IIFH, Value of the Index Hypofrontality (Kurtosis of the Normal Distribution CDa1 in the Frontal Electrodes); AH, Value of the Asymmetry of CDa1 in the Frontal Electrodes; CV% - the coefficient of variation; CI, Confidence interval; cu, conditional unit

Introduction

Psychiatric inspection of young men - very important task designed to solve a set of socioeconomic problems. On the one hand is a question of providing future state, with another - need of identification of persons with cognitive and behavioural violations with inevitable economic losses for the state and danger of access to weapon and transport of the persons having behavioural deviations; with the third is an observance of interests of young men which rights are violated if they have diseases, but are recognized as healthy, for example, on the military commissions.¹ In this regard the question of inspection of the young men having deviations of mental health is particularly acute. These diseases are difficult diagnosed as it is rather easy to feign or dissimulate them. This circumstance is facilitated by the fact that psychiatry - the only medical discipline which has no objective

methods of a research and psychiatric inspection is extremely limited to the small time which is released for inspection of one surveyed. Very optimistically estimates of functional methods of a research of a mental state given in the corresponding methodical managements aren't true at all. Not only that all existing methods aren't specific and aren't capable to reveal any mental diseases, so they are still incredibly labor-consuming, demand a large number of the qualified doctors of functional diagnostics, and their results for the medical expert are insufficiently thorough. The question of search of dimensional methods of a research of mental diseases is particularly acute now extremely. It is connected with search of a new paradigm of mental diseases in which the leading role has to be occupied verified, but not subjective methods of diagnostics, and them just and isn't present. Numerous attempts to connect the data obtained by tool methods with psychopathology weren't crowned with success.¹ Perhaps, the situation can be changed, having applied new approaches in a technique of psychiatric inspection of young men. Their essence consists in coordination of emergence of psychopathology with disorganization of activity of neural and glial network of a brain (NGS of hypermarket). A marker of this process is recently opened technique of dispersion of amplitude-frequency characteristics of an alpha rhythm of EEG (DAFCAR).² Detailed consideration of this technique is presented in the given literature.³ In the simplified look the main idea is that extent of disorganization of an alpha rhythm is directly proportional to extent of disorganization of NGS of hypermarket which is the cornerstone of psychopathology.⁴ The measured DAFCAR parameters are markers of mental diseases. This hypothesis has been checked at 4660 patients with various clinical forms of psychopathology. Amplitude-frequency characteristics of an alpha rhythm of EEG by the developed author's technique of determination of coefficients of dispersion - CDa1 and CDa2 were investigated. KDa1 is the relation of power of modal frequency of an alpha rhythm to its total power in all the alpha rhythm range (7-13 Hz). KDa2 - the alpha rhythm power relation in an interval “the frequency of the modal power of ± 0.5 Hz” to total power. IIDA - the integrated index of dispersion - an indicator of dispersion Kda1 in occipital assignments. IIFH - the integrated index of a hypofrontality - an indicator of dispersion Kda1 in frontal assignments. The calculated

coefficients by means of the correlation and regression and spectral analysis were compared to extent of violation of quantitative EEG and clinical data. More evident is the kind of the dispersive analysis of an alpha rhythm - dispersive mapping.³ In the Figure 1 average comparative cartograms normal are presented and at paranoid schizophrenia of F20.094 (on ICD-10). This method of diagnostics has gone beyond theoretical researches. It is practically applied by us (Rosman S. V., 2013–2017) in diagnosis of mental diseases and observations of dynamics of pathological processes at patients in hospitals Tver (Russia).

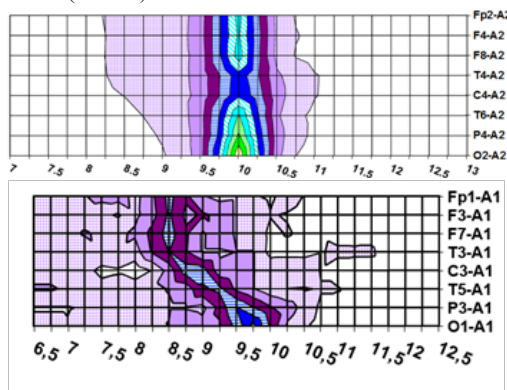


Figure 1 The average dispersive cartogram is normal (A) and at a debut of schizophrenia (DSch) of F20.094 (B). Across – the frequency of an alpha rhythm, Hz.

Table 1 Results of inspection of young men by means of DAFCAR technique

Diseases	N	Age (conf. Interv.), year	Frequency alpha-rhythm Hz, M±s	Left hemisphere				Right hemisphere			
				CDa1 M±s	CDa2 M±s	IIDA M±s	IIH M±s	CDa1 M±s	CDa2 M±s	IIDA M±s	IIH M±s
Health	44	21.7 (17.0-22)	10.4 ±0.14	0.286 ±0.04	0.739±0.06	7.305±1.9	6.293±2.6	0.294±0.05	0.759±0.07	7.207 ±2.3	6.085 ±3.0
PD F60 on ICD-10	53	17.8 (16.5-18.6)	10.0 ±0.11	0.229 ±0.09	0.628 ±0.15	4.904 ±2.9	3.86 ±2.6	0.232 ±0.1	0.634 ±0.16	4.943 ±3.5	3.828 ±3.2
MMR F70 IIO ICD-10	46	17.6 (16.3-18.2)	9.5 ±0.09	±0.09	0.567 ±0.18	3.851 ±3.5	3.167 ±3.7	0.203 ±0.09	0.572 ±0.17	4.16 ±3.8	2.868 ±3.8

Discussion

It is obvious that at differential diagnostics of intellectual backwardness of easy degree from frustration of the personality and from healthy patients in indicators of DAFCAR there are statistically reliable distinctions. The last are confirmed by a hypothesis that increase of organic changes in a brain is followed by aggravation of entropy of neural network, being shown by increase in dispersion of an alpha rhythm and decrease in values of coefficients of dispersion.⁵⁻⁸ Significant changes are observed also in dispersive cartograms of DAFCAR (Figure 2). If to add that the program allows to investigate heart by means of the virtual applications “Cardiovizor” and “Cardiointervallograph” by R.M. Bayevsky’s method allowing to reveal pathology of cardiovascular system and vegetative violations at early stages, then it is possible to consider that to some extent requirements of methodical instructions can be fulfilled with the minimum economic losses, without attraction of a large number of experts of EEG and at rather high methodical level.

Research objective

Optimization of process of psychiatric inspection of young men during passing of psychiatric examination.

Materials and methods

At a standard technique of EEG of inspection of the young men who have come to expert office of GBUZ OKPND in 2015-2017 the innovative way of data processing of the spectral analysis of EEG–DAFCAR by means of the computer program “Detector of Neuromental Disorders” (DNPD) acting on the basis of the serial medical analyzer-monitor of biopotentials of a brain “Neurovizor-BMM, productions of LLC Medical computer system (Zelenograd–Moscow, Russia) in the form of a functional diagnostic complex is applied.² Results of a research have been applied in the differential diagnostics which is the most often met at young men of diseases - frustration of the personality and intellectual backwardness of easy degree and are presented in the Table 1. Application of DNPD in the real work in 2014-2017 at inspection of 143 patients, has revealed that the sensitivity of a technique is 72%, specificity-85%.

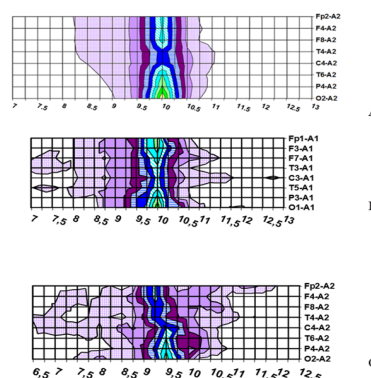


Figure 2 The comparative characteristic of dispersive cartograms of DAFCAR is normal (A), at frustration of the personality (F60 on MKB, B) and intellectual backwardness (F70 on ICD-10, C). Increase of dispersion of an alpha rhythm, his general and regional delay in frontal lobes is observed (hypofrontality) at intellectual backwardness. Across – the frequency of an alpha rhythm, Hz.

Conclusion

Application of the DAACAR method in practice of work of psychiatrists lifts possibilities of a diagnostic situation to qualitatively new level, entering objective methods into absolutely subjective process of diagnosis of mental diseases, optimizing process of examination and verifying conclusions of experts; there was a possibility of performing differential diagnostics of intellectual backwardness from frustration of the personality on the basis of objective methods. Use of “Detector of neuromental disorders” (DNPD) in carrying out VVK improves process of inspection of examinee, allows not only to execute the full volume of researches in real time, but also to reduce its duration and also to reduce participation of scarce specialists in an electroencephalography. DNPD is the innovative device for functional neurophysiological researches at any age, especially in children’s and youthful in this connection it can be recommended for carrying out screening personal researches in daily clinical practice of treatment and prevention facilities and in work of the psychiatric commissions. Broad studying of the DAFCAR method will allow to unify it, to reveal limits of diagnostic competence and to lay the foundation for removal of psychiatry in a rank of dimensional sciences.

Acknowledgments

None.

Conflict of interest

All the authors declare that they have no conflict of interest.

References

1. Rosman SV. Pedophilia in the Context of Entropy Neuron Glial Networks of the Brain. *Glob J Add & Rehab Med.* 2017;4(2): 555632.
2. Maximova NE, Rosman SV, Civilian LV. Possibilities of use of dispersion of an alpha rhythm for screening verification of mental diseases. *Mental health.* 2016;1:16–25.
3. Rosman S. The Theoretical Foundations of Dispersion of Amplitude-Frequency Characteristics of the Alpha Rhythm of the EEG. *Glob J Add & Rehab Med.* 2017;2(3):555587.
4. Rosman SV. Borderline Personality Disorder in the Context of Entropy Neuron-Glial Networks of the Brain. *Glob J Add & Rehab Med.* 2017;2(4):555595.
5. Rosman S. The Use of Analysis of Variance of the Alpha Rhythm of the EEG in the Study of the Pathogenesis of Alcoholism and the Causes of Alcoholic Deliria. *Glob J Add & Rehab Med.* 2017;2(1):555580.
6. Gaebel W, Becker T, Janssen B, et al. EPA guidance on the quality of mental health services. *Eur Psychiatry.* 2012;27(2):87–113.
7. Rosman S, Kurakhina O. Violent Crime in the Context of Entropy Neuron-Glial Networks of the Brain. *Glob J Add & Rehab Med.* 2017;2(5):555599.
8. Rosman SV. The Debut of Schizophrenia in the Context of Entropy Neuron-Glial Network of the Brane. *Glob J Add & Rehab Med.* 2017;3(4):555617.