



**Research Article**

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# Inverse Schizophrenia in the Context of Entropy of Neural and Glial Network of the Brain



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## Abstract

In article an attempt of systematization of the neurophysiological changes observed at a special form of schizophrenia by means of a new technique - dispersion of amplitude-frequency characteristics of an alpha rhythm of EEG - for the purpose of identification of the general regularities of development of psychopathology, search of new neurophysiological forms of schizophrenia and differential its mentally retarded diagnostics and autism is made.

**Keywords:** Neurophysiological Features of Schizophrenia; Entropy of the Neuron-Glial Network of the Brain; Dispersion of Alpha-Rhythm; Diagnosis of Mental Illness

**Abbreviations:** NGNB: Neuron-Glial Network of the brain; HVT: Hyperventilation Test; DAFCAR EEG: Dispersion of Amplitude-Frequency Characteristics of an Alpha Rhythm of EEG; DNPd: Detector of Neuro Mental Disorders

## Introduction

The problem of search of a new paradigm of psychiatry consists not only in separate disagreements of specialists in an occasion of clinical distinctions of separate nosological forms of mental diseases. It is necessary to understand what the cornerstone of psychopathological patterns is. And it is possible to understand it only having learned by what changes in neural and glial network of a brain (NGNB) they are followed. Sometimes on this way absolutely unexpected circumstances open. The problem which will be stated in this article rather seldom arises, and, maybe, we too seldom pay to it attention owing to insufficiency of means in official medicine. It is about the main problem diseases of psychiatry - dementia, schizophrenia and autism. In the 19th century the idea about a certain "uniform disease" in psychiatry - "the theory of uniform psychosis" of Grizinger was stated [1]. However, at that time it was not succeeded to prove it as even there is no rather fair idea of the reasons of mental diseases now. In many articles devoted to the matter, the idea expressed that the psychopathology is result of pathological increase of level of entropy of NGNB - the general or regional. "System 3+3" [2] explaining the psychopathology mechanism was offered:

## Informational Bases of Formation of Mentality of the Person

- Process of afferent synthesis of the entering information - internalization of information
- Creation on the basis of afferent synthesis of system of semantic images of an environmental real

- Formation on the basis of the system of semantic images of socially acceptable behavior models in the form of the efferent answer.

## Main Criteria of a Mental Condition of the Person

- The normal state of mentality - on the basis of reference afferent synthesis is created the system of semantic images of an environmental real, congruent for this look, on the basis of which socially acceptable behavior models of an individual are created
- The psychopathology - violation of normal process of afferent synthesis, in result of what is created pathological polysemantic of images of an environmental real on the basis of which socially unacceptable behavior models of an individual are formed
- A marker of process of violation of afferent synthesis is the degree of an entropy of NGNB, which is shown in DAFCAR EEG. The purposes and tasks - identification of new neurophysiological forms of schizophrenia and their differential diagnostics with other mental diseases.

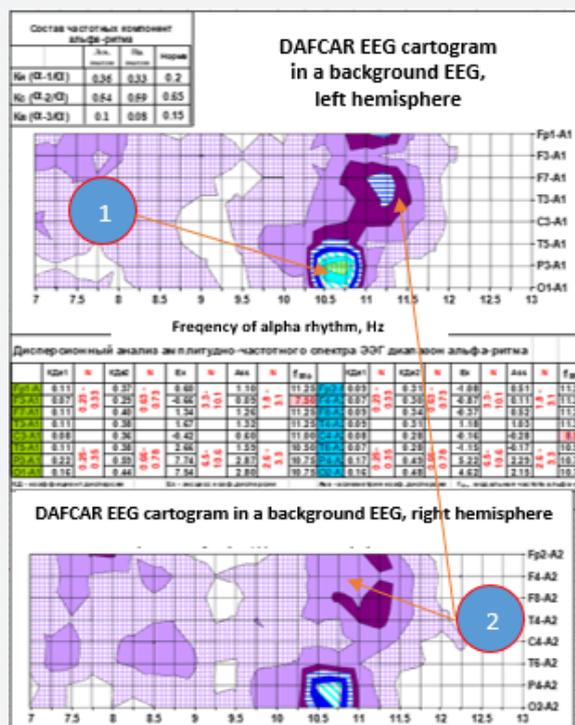
## Materials and Methods

By means of a technique of the analysis of DAFCAR EEG of two patients are studied. The cases represented here are rather rare therefore it is difficult to submit statistics - it is necessary to be limited to the description of two clinical cases. Patients - the man and the woman - about one age, both have a mental disease

since the childhood and since the childhood contain in psychiatric boarding schools. Patients were exposed to a standard technique of performance of EEG with arrangement of electrodes on the international system “10-20%” and ipsilateral ear electrodes. HVT was carried out by a standard technique with dispersive assessment of changes of an alpha rhythm by S.V. Rosman’s method [3]. The DAFCAR parameters were calculated by S.V. Rosman’s method by means of the Microsoft Excel and Statistica 12.0 programs [4].

**Results**

With both patients the contact as they do not own speech skills is complicated. Incidents of psychoses were not observed. Psychological testing is impossible. They spend the most part of time alone, are interested in nothing. The diagnosis “Deep intellectual backwardness” is exposed to both. At a research of the DAFCAR parameters it is established (Figures 1 & 2).



**Figure 1:** DAFCAR EEG cartograms, woman, 30 years, deep intellectual backwardness. 1 - normal rate of an alpha rhythm (10 Hz); 2 - a tendency to acceleration of an alpha rhythm in frontal departments (increase in representation of a high-frequency part of a range of an alpha rhythm in frontal assignments) and 3 - sharp increase of this sign at HVT.

**Discussion**

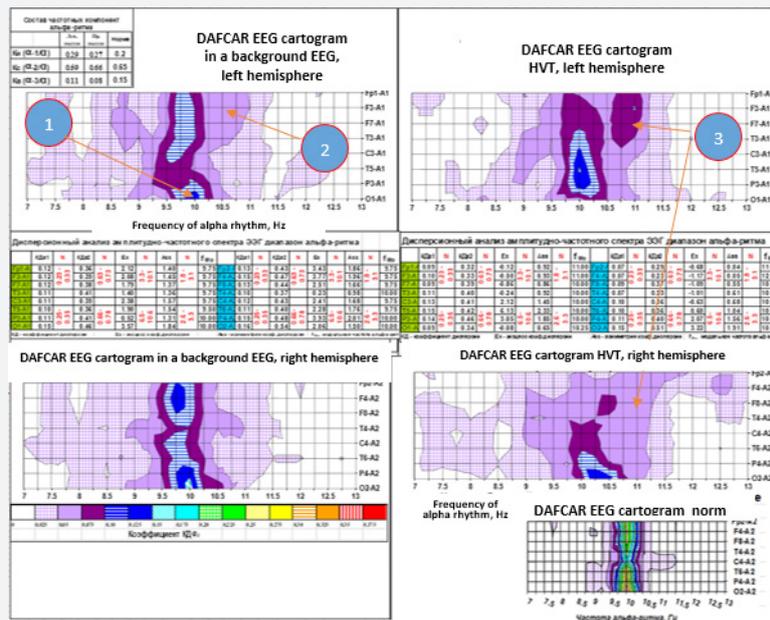
For comparison we give cartograms at typical paranoid schizophrenia and typical endogenous reaction to HVT at schizophrenia [5]. Thus, at paranoid schizophrenia increase in representation is observed medlennovolno-howl parts of a range of an alpha rhythm with increase of the shift of modal value, characteristic of schizophrenia, in frontal departments to the left and the expressed increase of dispersive changes, mainly in frontal assignments. Thus, in Figures 1 & 2 we see the inverted picture of dispersive violations of an alpha rhythm in comparison with paranoid schizophrenia, as allowed to call these cases “the inverse schizophrenia”. If the data provided in this article are obtained by clinical confirmations at other researchers, then it is possible to draw very serious conclusions. Sharp decrease in frequency of an alpha rhythm is characteristic of deep intellectual backwardness, as well as of all dementias. There is even a correlation communication between the frequency of an alpha rhythm and IQ - the alpha rhythm frequency is lower, the IQ is lower [6]. Thus, the presented cases are not intellectual backwardness. At the same

time it and not typical schizophrenia owing to the DAFCAR inverse parameters (Figures 3 & 4). This state is the closest to autism, however about it there are no researches in the field of DAFCAR. It is very probable that a certain part of autism is presented by such conditions of “the inverted schizophrenia” [7-8]. Indirectly it is confirmed, for example, the fact that at Asperger’s syndrome sharp acceleration of an alpha rhythm is observed and clinically observes the expressed intellectual backwardness.

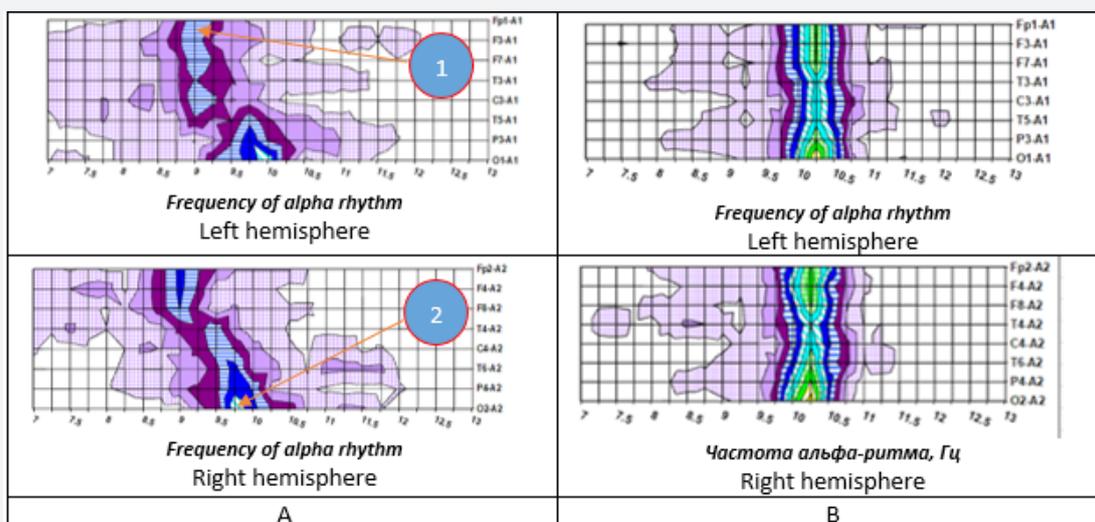
The given cases explain one more fact which did not find an explanation in official science – growth of autism in the developed countries, despite good food and education, a healthy lifestyle and the other benefits of a civilization. The matter is that in ontogenesis the alpha rhythm gradually accelerates from 3 years approximately on 1 Hz a year. This phenomenon is called by me “a neurophysiological overclocking”, by an example of an overclocking of the central processing unit of the computer. This process has to take place with a certain speed and evenly in all departments of a brain. However often, owing to some conditions, the uniformity of this acceleration is broken, and

most often in frontal departments. When the alpha rhythm in frontal departments slows down, clinically we observe ADHD and other behavioural violations, for example, enuresis [9]. And here the uncontrollable “neurophysiological overlocking”, perhaps, leads to autism especially as in the developed countries information load of children, which can stimulate raises uncontrollable acceleration of an alpha rhythm in frontal lobes. It has, sometimes, far-reaching consequences, even when externally the brain developed evenly – quite often these violations have the hidden character and come to light only after hyper ventilating test. Such patients have reduced resistance to a stress and are

capable to deviant behavior – violence, psychoses, addictions. I give an example of normally organized EEG at the patient who committed violent crime (Figure 5). To similar neurophysiological changes in Russian there is a figurative definition: “the roof goes”. It very precisely reflects a condition of the people enduring the moment of intense violation of mentality [10-11]. At alcohol intake or psycho-emotional loading at people with low resistance to a stress something is observed like a schizophrenic attack with loss of orientation in time, space and the personality and the accompanying deviant behavior.



**Figure 2:** DAFCAR EEG cartogram, man, 34 years, deep intellectual backwardness. 1 – normal rate of an alphas rhythm (10.75 Hz); 2 – the expressed acceleration of an alpha rhythm in frontal departments (increase in representation of a high-frequency part of a range of an alpha rhythm in frontal assignments). The HVT is not executed due to the lack of contact with the patient.



**Figure 3:** Average cartograms of DAFCAR EEG at paranoid schizophrenia (A) is also normal (B) - increase in representation of a low-frequency part of a range of an alpha rhythm with the characteristic shift of modal value in frontal departments (1) rather occipital (2) to the left - more than 0.75 Hz.

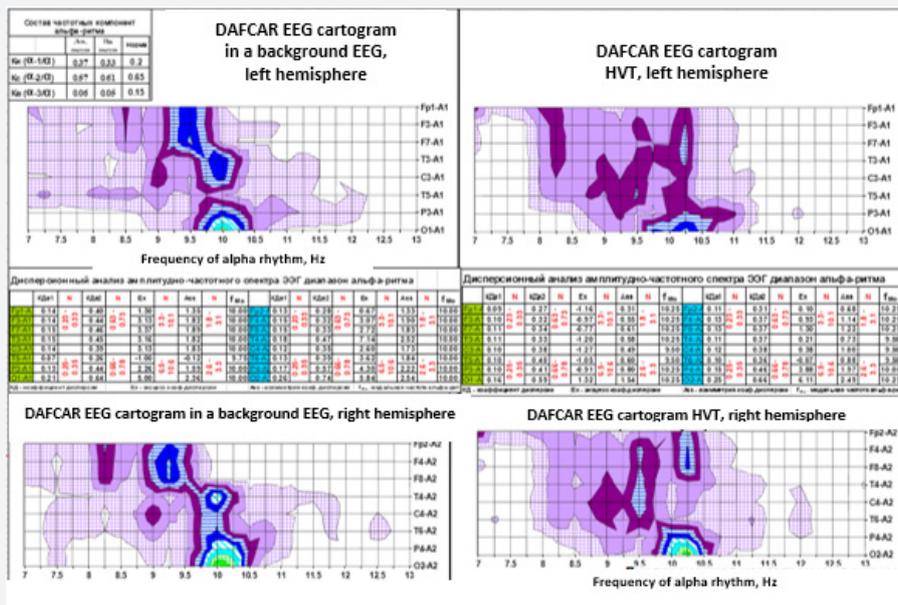


Figure 4: Typical average cartograms of DAFCAR when carrying out GW at paranoid schizophrenia.

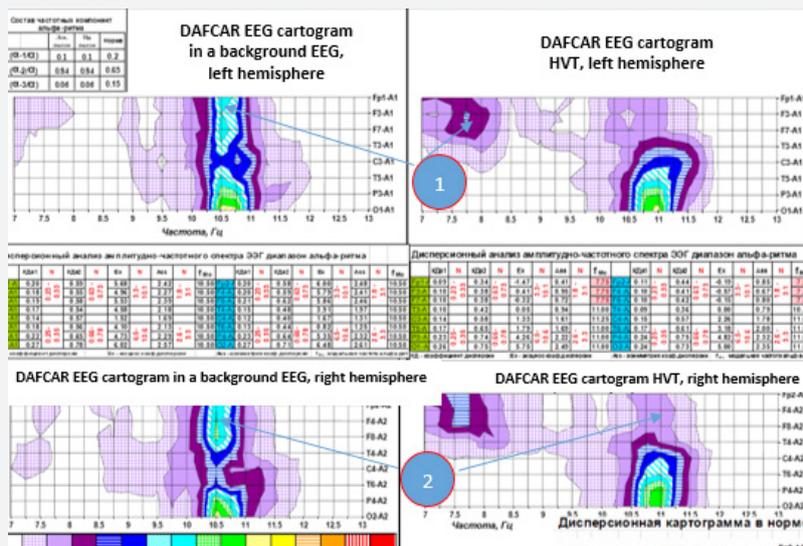


Figure 5: The man, 21 years, is mentally healthy, violent crime. Sharply expressed endogenous reaction in frontal lobes at HVT with the sharp shift of modal value of frequency of an alpha rhythm to the left (delay of rather occipital assignments) (1) and increase of dispersive violations (2).

Conclusion

- a) By means of the DAACAR EEG method it is possible to analyse a condition of NGNB for the purpose of identification of pathological general and regional increase of its entropy that is the main reason for psychopathology.
- b) There is a possibility of identification of new pathological conditions of mentality which reason was unknown earlier. The technique is simple, objective, allows to establish correlation connection between clinical and neurophysiological manifestations of mental diseases.
- c) The device for screening of psychopathology on the basis of the DAFCAR EEG parameters - "Detector of Neuropsychopathology"

Disorders" (DNPD), which allows to reveal probable belonging of this pattern of EEG to psychopathological within 5 minutes is created.

d) Use of this device will allow to pass to a 3-landmark method of identification of psychopathology into populations: neurophysiological screening, psychological testing, consultation of the psychiatrist.

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