



Review Article

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Syncope in the Context of Disorganization of Neural and Glial Network of a Brain

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Abstract

By means of a new method - dispersion of amplitude-frequency characteristics of an alpha rhythm of EEG the evidence that to a syncope is a consequence of functional disorganization of neural and glial network of a brain with a hypofrontality that can become the reason of the termination of information exchange between an organism and the external environment in the presence of the minimum violations of blood supply which aren't registered at cardiological inspection are produced.

Key words: Syncope; Dispersion of alpha rhythm

Abbreviation: NGNB: Neural and Glial Network of a Brain; DAFCAR EEG: Dispersion of Amplitude-Frequency Characteristics of Alpha Rhythm of the Electroencephalogram

Review

To syncope is a syndrome, very widespread in neurologic practice. For example, in Great Britain to a syncope and a collapse (R55 on ICD-10) are the sixth most widespread reason of the emergency hospitalization of adults 65 years in medical hospitals are more senior. The average duration of these hospitalization is 5-17 days that displays a variety of tactics of maintaining to a syncope and availability of certain tests. Only one hospitalization is 74% of the expenses going for inspection of the patient with a syncope [1].

It is considered that to a syncope is a state at which there is a short-term loss of consciousness caused by decrease in brain blood circulation. The term to "syncope" is often used as a synonym of the concept's "faint", "temporary loss of consciousness", "consciousness switching off". This state connected as with neurologic (vegetative and not vegetative), and the cardiac reasons. Psychological and mental states are the reasons to a pseudo-syncope which it is difficult for syncope to distinguish from true.

Long recidivous syncopal states, for different data, about 12-48% of healthy young people and about 6% elderly. Results of poll of students (on average 20-year age) which has shown that about 20% of young men and 50% of girls at least once in life have tested

to a syncope are given in work of W Wieling (2004). J. L. Newton and al. (Newcastle, Great Britain) have revealed that at 20% of patients with recidivous to a syncope other family member tested syncopal symptoms, having assumed thereby hereditary character.

Researches have shown that the autonomic nervous system plays a leading role in a pathophysiology. There are certificates on existence of dysfunction of the central and peripheral nervous system [2].

Now in all countries the office of treatment of syncope are created to organize in themselves the corresponding multidisciplinary skills and experience.

Search of the reasons of these states is run by process of elimination - generally try to find cardiovascular frustration which could lead to sharp violation, for example, of brain blood circulation. And it is much simpler to make it in cardiology, than to find significant signs of neurologic frustration in connection with insufficient development of diagnostics of defeat of the NGNB.

At the same time some researchers have reported about high prevalence of alarm, a depression, somatic frustration and an alcoholism at patients with not clear to a syncope. Moreover, some authors have found out that at patients with recurring to a syncope

of various etiology also considerably the quality of life both in physical, and in the psychological relation [3].

At patients with a syncope psychiatric examination is generally carried out by method of the structured interview with the psychologist and/or by means of the special questionnaire. The questionnaire of Minnesota Multiphasic Personality Inventory-2 (MMPI-2)-the most widely recognized means for assessment of the psychological status of the adult is most often used. After psychological examination clinical diagnoses are formulated according to criteria of the Diagnostic and statistical guide to intellectual frustration-IV (Diagnostic and Statistical Manual of Mental Disorders-IV (DSMD-IV).

Some authors have estimated influence of introduction of stationary protocols [2]. These researches have shown that it is possible to improve diagnostics and to optimize inspection. However, many unnecessary researches and hospitalization are still carried out. Thereof costs of inspection and diagnostics have increased. The present short publication doesn't apply for the comprehensive research explaining the reasons of the phenomenon in which big institutes are engaged. These are rather notes from practice which allow to look at a problem from the new party – process of violation of information exchange in the damaged neural and glial network by means of new, for the present poorly known method – DAFCAR EEG [3].

Really, very small attention is for some reason paid to the fact that a syncopal state – process of violation of information exchange between the person and the environment. According to his success is connected by the previous publications with functional solvency of neural and glial network. It is quite logical to assume that such borderlines of NGB at which the slightest dysfunction connected with increase in requirements to functional ability of hypermarket leads to his full disorganization and the termination of information exchange with the external environment are possible.

Before identification of such violations presented insuperable difficulties owing to complexity and high cost of such researches.

However, the researches made in various fields of psychopathology by means of a new method – DAFCAR EEG, have shown that there are correlation communications between psychopathology and disorganization of NGB, and DAFCAR EEG – a marker of these violations.

For the purpose of identification of violations in NGB at syncopal violations 47 people more young have been examined than 50 years: men-23, women-24. Middle age: men-32.2 years, women-29.9 years. Investigated EEG with standard imposing of electrodes on the international 10-20 system with registration in the background at rest blindly and after hyper ventilating test was carried out. Further the range of EEG was processed according to the special program [4] and about the help of the statistical Statistica 12.0 program. At all these sick EEG it was carried out with the differential and diagnostic purpose because at cardiological researches (the ECG, ultrasonography) significant violations it was revealed not.

As a result of researches, the following regularities have been revealed.

- At all patient's various violations of DAFCAR EEG are established to a syncope; in one case there were no normal indicators.
- The general frequency of an alpha rhythm was in normal limits - 10.0 ± 0.25 Hz.
- Alpha rhythm frequency in frontal assignments (F3, F4) was below norm on average on 0.5-0.75 Hz that demonstrates existence of a functional hypofrontality.
- The DAFCAR dispersive indexes were much lower than normal values that demonstrates the moderated or expressed disorganization of functional ability of NGB [3,4].
- These regularities are clearly demonstrated on the given dispersive cartograms. In figure 1 the average cartogram at men is presented. Data are normalized in comparison with DAFCAR EEG cartogram during other researches (Figure 1).

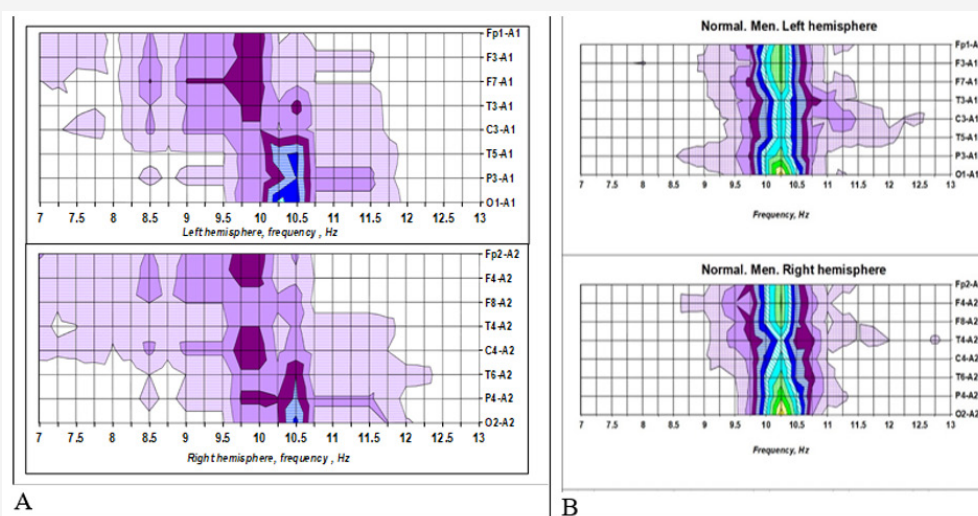


Figure 1: Comparative cartograms of DAFCAR EEG at syncopal states (A) is also normal (B).

Conclusion

1. Patients with attacks to a syncope have signs of functional disorganization of NGNB.
2. Disorganization of NGNB is shown in a dissynchronization of activity of the cellular elements making her: in practice considerable splitting of a range of an alpha rhythm of EEG is registered.
3. These changes easily can visually also be registered by means of DAFCAR EEG technique with creation of cartograms and calculation of the DAFCAR indexes.
4. With high degree of probability, it is possible to claim that syncopal states come in result of functional inferiority of NGNB, in which even insignificant violations in blood supply of a brain, which normal don't cause any changes can provoke the termination of information exchange with the external

environment – loss of orientation in time, space and the personality [5].

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