

in magnitudes of the alpha- and beta-rhythm average capacity are registered. The average capacity of alpha-rhythm in the frontal derivations on the left is $3,9 \text{ mcV}^2/\text{c}^2$, on the right – $1,9 \text{ mcV}^2/\text{c}^2$. The average frequency is accordingly 8,5 and 10,3 Hz. The average capacity of alpha-rhythm in the occipital derivations on the left is $8,4 \text{ mcV}^2/\text{c}^2$, on the right – $7,9 \text{ mcV}^2/\text{c}^2$. The average frequency is accordingly 10 and 10,5 Hz. The average capacity of low-frequency beta-rhythm in the frontal derivations on the left is $0,6 \text{ mcV}^2/\text{c}^2$, on the right – $0,1 \text{ mcV}^2/\text{c}^2$. The average frequency is 16,3 Hz on the left accordingly. The average capacity of low-frequency beta-rhythm in the occipital derivations on the left is $1,7 \text{ mcV}^2/\text{c}^2$, on the right – $1,5 \text{ mcV}^2/\text{c}^2$. The average frequency is accordingly 15,8 and 15 Hz. The average capacity of high-frequency beta-rhythm in the frontal derivations on the left is $0,4 \text{ mcV}^2/\text{c}^2$, on the right – $0,0 \text{ mcV}^2/\text{c}^2$. The average frequency is accordingly 28,3 Hz on the left. The average capacity of high-frequency beta-rhythm in the occipital derivations on the left is $0,5 \text{ mcV}^2/\text{c}^2$, on the right – $0,5 \text{ mcV}^2/\text{c}^2$. The average frequency is accordingly 24 and 22,5 Hz. The reactive pathology type is defined. The action was carried out by means of binaural rhythm set of the following frequencies: 10,3 Hz (the average alpha-rhythm frequency in the frontal derivations on the right, 15 and 22,5 Hz (the average frequencies of low- and high-frequency beta-rhythms on the right). The effect time for one séance made 40 min. Ten séances were carried out.

After the correction the emotional state of the patient improved, the attention and working capacity increased. Against the background of total alpha-rhythm capacity increase the asymmetry of biopotential distribution in the anterior cortex regions decreased. The alpha-rhythm zonality restored.

References:

1. Luchinin A.S. Psychophysiology. Compendium of lectures. – Rostov-on-Don: "Phoenix", 2004. – p.320.
2. Nebylitsyn V.D. Psychophysiological research of individual differences. – M: Nauka, 1976. – p.336.
3. Psychophysiology: Textbook for higher educational institutions / Under the redaction of Aleksandrov Yu.A. St. Petersburg: Piter, 2003. – p. 496.
4. Simonov P.V. Theta-rhythm and mechanism of quantization of engram retrieval // Memory. Trace processes. Thesis of the report at IV all Union Conference.- Pushchino, 1979, p.6.
5. Simonov P.V. Functional asymmetry of frontal neocortex and emotions // AS RAS Report, 1994. – V. 338. - № 5. – p.689.
6. Strelets V.B. Disorders of bodily machinery of sensation, affection and cogitation at some kinds of psychic pathology // Human physiology. 1989. – V.15. - №3. – p. 135.
7. Frolov M.V. Human functional state control. – M.: Nauka, 1987. – p.208.
8. Heller W. Neuropsychological mechanisms of individual differences in emotion, personality and arousal // Neurophysiology. 1993. – V.7. – p. 476.
9. Schneider F., Grodd W., Gur R.E. et al. PET and fMRI in the study of emotions // ISNIP/ - Frankfurt, 1995. – p. 76.

The article is admitted to the International Scientific Conference "Medical, social and economic problems of preservation of health of the population", Turkey, May, 21-28st 2007, came to the editorial office on 15.04.2007

AGE-DEPENDENT DYNAMICS OF ELECTROENCEPHALOGRAPHIC CHARACTERISTICS IN IDIOPATHIC ARTERIAL HYPOTENSION PERSONS

Chefranova Zh. Yu., Titova L.P., Makotrova T.A.
Belgorod State University, Medical Department,
Chair of Nervous Diseases and Medical
Rehabilitation, Regional Clinical Hospital of
Sanctifier Josaphat

Idiopathic arterial hypotension – IAH (the term is recommended by the International Statistical Disease Classification of the 10th Revision) or essential arterial hypotension (PAH), attends the life of a great number of people. According to the current information every one of three women and 25 men suffers from it; it being approximately 33% among women and 4% among men, thus, reaching about 12-15 %.

We (together with Laskov V.B. and Plotnikov V.V.) have carried out an EEG-analysis of 60 different ages IAH patients

[Chefranova Zh.Yu., 1999] found out among the medical personnel of the MPI, and 30 healthy people. Among those with IAH there were 54 (90%) of women and 6 (10%) of men. There were 3 groups defined: the first one was made up of 22 persons aged from 18 to 35 years old, the second – 18 persons aged 35-55 and the third – 20 persons aged 56-62.

The IAH diagnostics criteria correspond to traditional idea of IAH [Troshin V.D., 1991].

1. Long lasting arterial hypotension, BP numbers are lower than 105-100 and 65-60 mm hg.

2. Indications of earlier angio-hypotensive episodes available.

3. Arterial hypotension chronicity beginning with the age of 12-15.

4. Absence of anamnestic and clinical signs of chronic physical and neurologic diseases, CCT, neuroses.

5. BP figures, according to the daily monitoring (DMBP), correspond to the adopted in Europe criteria of hypotonic conditions diagnostics.

We didn't include trained female athletes and those who arrived from the Thule or highland into this group. The occupational composition was like that – doctors, teachers, accountants, employees.

The control group was made up of healthy women having no chronic diseases and CCT. The occupational composition was as follows: accountants, nurses, railway transport traffic inspectors. The three identical age subgroups, each one having 10 persons, were defined as well as in the patient group.

Physical examination of the patients was carried out according to generally accepted neurologic methods.

The average BP values made $99\pm 0,6$ and $69\pm 0,5$ mm hg in IAH persons in the 1st age group, $104\pm 0,3$ и $70\pm 0,1$ – in the 2nd one and 106 ± 3 and 71 ± 2 mm hg – in the 3rd age group. In healthy people the corresponding figures were $120\pm 0,6$ и $77\pm 0,7$ mm hg – in the 1st group, $124\pm 0,3$ и $81\pm 0,2$ – in the 2nd one and $130\pm 0,2$ и 81 ± 2 mm hg – in the 3rd age group.

EEG methods. For the EEG a program-apparatus complex including the 16-channel electroencephalograph - EEG 16S, an input unit and PC were used. The EEG was carried out with the help of standard program package, including

those against the background of functional tests (opening and closing eyes, rhythmical photostimulation, CO₂-withdrawal seizure).

The baseline EEG record was carried out Ante Meridiem in a screened and soundproof booth. The patient was in a special armchair semirecumbent, with the eyes closed.

The baseline EEG physiologic rhythm indexes' analysis proved the literature data that relative EEG characteristics' stability remains unchanged in healthy people up to about 50. From that very period the EEG specter alteration, which is manifested in alpha rhythm representativeness decrease and slow delta rhythm index increase [Chugunov S.A., 1950; Zenkov L.R., Ronkin M.A., 1991, and others], occurs. The physiological rhythm index dynamics, with the age increase, in the IAH patients was like that in the healthy examinees' group, but manifested itself much earlier (since 36).

The physiological rhythm indexes in IAH and healthy persons statistically authentically differ in the juvenile age with greater alpha rhythm representativeness in IAH patients. In the middle of life the index differences evanesce, and late in life the statistically authentic alpha rhythm representativeness decrease and slow theta rhythm increase become apparent, that testifies to brain activation power decrease [Leitis N.S. and others, 1980; Izyumova S.A., 1980; Mori F., 1973, and others].

The correlation coefficient of fast and slow waves (C f/s) remained steady up to 55, after that it authentically decreasing on account of slow wave component; it testified to the age-dependent weakening of CNS activation level [Golubeva E.A. and others, 1974].

The C f/s age dynamics in the baseline record in IAH patients is like that in healthy examinees, but the absolute C f/s value marked in healthy people after 55 is reached by IAH persons by 36 already.

The CO₂-withdrawal seizure test in IAH persons has shown up the C f/s decrease in the juvenile age already with the aggravation of this phenomenon in older age groups. The C f/s differences between healthy and IAH persons become apparent in the middle age and grow much more late in life.

The opening-closing eyes test authentically showed up the low alpha-activity inhibition level at IAH late in life; in 55% of these people the

reaction assumed an invert character in the form of alpha rhythm appearance, with its absence or weak representativeness in the baseline EEG, that testifies to the originally low FS brain level [Rusinov V.S., 1960; Mayorchik V.Ye., and others].

The photostimulation driving rhythm had no essential differences in healthy and IAH persons.

As the result of the research we have stated that the EEG characteristics of practically healthy people in different age-dependent stages are steady and change with the increase of years very little, only in the elder age group an alteration of the EEG baseline structure occurs: the alpha rhythm representativeness decreases, the slow delta rhythm index grows, the C f/s decreases, the flicker-light enforced rhythm assimilation weakens. In IAH patients these alterations are more vivid and are manifested already in the middle age group (from 35) and considerably increase in the elder one, that testifies to the CNS activation level decrease and nervous processes inertness increase.

From now forth, under a new examination of more people we succeeded to specify the EEG alterations in various age periods both at IAH and in apparently healthy people.

Totally, we included 190 people into the research: 110 – with IAH and 80 –apparently healthy. The groups' membership was as follows: the first one – 40 persons aged from 18 to 35; the second – 40 persons aged from 36 to 55 and the third one – 30 persons aged from 56 to 62.

The groups of comparison contained accordingly 30, 30 and 20 persons and consisted of clinically healthy people of the same age categories.

As the result of this new extended investigation we have noticed that with the increase of years alpha rhythm representativeness decreases authentically and sharply, and simultaneously, theta- and especially beta rhythm representation (that was not evident during our first investigation) increases. There were statistically authentic alterations of the specified aspect between the 1st and the 2nd, the 1st and the 3rd groups of patients. The index correlation coefficient of fast and slow waves decreased both at baseline records and the CO₂-withdrawal seizure test.

In IAH persons we have distinguished still more sharp than in the healthy, alpha rhythm representativeness decrease in the 2nd and 3rd groups, but in the 1st age group the alpha rhythm representativeness index, as well as at the previous our investigations, was authentically higher in IAH patients than in healthy ones of the same age. At the same time beta- and theta rhythm representativeness increased significantly. Both in IAH and healthy persons the index correlation coefficient of fast and slow rhythms decreased in the baseline EEG and at the CO₂-withdrawal seizure with the increase of years.

According to beta rhythm representativeness the 1st and 2nd IAH groups fall behind and the 3rd one outruns the corresponding groups of healthy persons. The correlation coefficient of fast and slow rhythms was authentically lower than in healthy persons both in the baseline EEG and at the CO₂-withdrawal seizure in the 1st IAH group persons.

The inhibition degree of alpha-activity in patients with IAH in every group is considerably lower than in healthy people.

There were no other distinct and statistically valuable EEG alterations with the increase of years noticed.

Thus, the structure of bioelectrical brain activity with the increase of years suffer changes both in apparently healthy and IAH people, however, at IAH the behavior of changes has got peculiarities reflecting, as it should seem, the function and cerebral formations' microstructure singularity. Alongside with this, there are authentic variations from the standard in IAH persons in the juvenile age already, that can be the effect of residual pathology and also the result of cerebral blood supply peculiarities against the background of dysontogenesis.

References:

1. Zenkov L.R. Clinical electroencephalography with elements of epileptology. M.: MEDpress-inform, 2002.
2. Laskov V.B. Dynamics of clinical-neurologic characteristics at primary arterial hypotension in age-dependent aspect / Laskov V.B., Plotnikov V.V., Chefranova Zh.Yu. // Problems of psychiatry, psychosomatics, addictology: scientific conference materials – Kursk, 1998.

3. Laskov V.B. Preliminary results of primary arterial hypotension neurophysiological research / Laskov V.B., Zhuravlyova T.V., Chefranova Zh.Yu. // On history of Mtsensk public health service and peripheral issues of secondary. – Oryol, 1997.

The article is admitted to the International Scientific Conference “Problems of the international integration of national educational standards”, Paris-London, April, 20-27th 2007., came to the editorial office on 08.02.07