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**MECHANISMS OF THE FORMATION OF "LOW-VOLTAGE" EEG-SYNDROME IN PERSONS,
SUBJECTED TO THE IONIZING RADIATION AS A RESULT OF THE CHERNOBYL
ACCIDENT**

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Neurophysiological investigations were performed in 75 men in age from 25 till 56 years, participated in Chernobyl accident consequences cleaning-up in 1986-1987 and irradiated in doses from 0.05 to 4 Sv. Neurophysiological investigations were performed on computerized 19-channel EEG analyzer "Brain Surveyor", SAICO (Italy) and "Multibasis" analyzer of "ESAOTE Biomedica" (Italy). The statistical analysis was carried out by Excel 4.0a and Statistica 4.3 programs.

The design of the investigation included several stages: I. Computerized EEG, registration of the brainstem auditory evoked potentials (BAEP), pattern reversible visual evoked potentials (PRVEP), somatosensory evoked potentials (SSEP). II. Syndrome analysis of EEG based on the algorithm of E.A. Zhirmunskaya (1991). III. Statistical selection of the evoked potentials (EP) parameters, which are most informative for the characteristic of the EEG-syndromes. IV. Calculation of the coefficients of the deviation (CDs) from the norm of informative parameters of EP which has allowed to take into account the degree of the deviation of the parameters as well as its direction ($CD = (A - A_{100}) / A_{100} \cdot 100\%$, where A - value of the investigated parameter, A_{100} - mean value of this parameter in the normal control). V. Comparison of the averaged CDs of the informative EP parameters with EEG-syndromes.

On the basis of visual analysis of EEG complemented with amplitude and spectral mapping following EEG-syndromes were revealed: syndrome of the hypersynchronization of the α -rhythm (syndrome I) - in 15 (20%) patients; syndrome of the disorganization of EEG rhythms with paroxysmal activity (syndrome V) - in 18 (24%); syndrome of the reorganization of the cortical rhythms with slowing down of the biopotentials (syndrome VI) - in 6 (8%) patients. In 30 (40%) patients the "low-voltage" polymorphic EEG with prevalence of δ - and β -rhythm spectral power and absence of reaction on external stimulation and functional tests was revealed.

The main informative parameters of EP were defined as follows: amplitude of III and V components of BAEP, amplitude of components P¹⁰⁰ PRVEP, N¹⁴⁵ and P²⁵ SSEP. Taking in consideration topography of the EP components, these parameters reflect, accordingly, the functional state of the pontine and mesencephalic reticular formation, thalamus and striatum nuclei and brain cortex.

Comparison of the averaged CDs of the informative EP parameters with described by E.A. Zhirmunskaya (1991) EEG-syndromes (syndromes I, V, VI) confirmed their magnitude in the group of irradiated persons, as well as adequacy of defined informative EP parameters for the characterization of quality distinctions between EEG-syndromes. Average values of CDs of the informative EP parameters in case of «low-voltage» EEG were as follows: CD of the amplitude of the III wave of the BAEP=-37%, CD of the amplitude of the V wave of the BAEP=-10%, CD of the amplitude of the component P¹⁰⁰ PRVEP=22%, CD of amplitude of component N¹⁴⁵ SSEP=-34, CD of the amplitude of the component P²⁵ SSEP=-31%.

The received results permit to suggest main pathophysiological mechanisms of the formation of «low-voltage» EEG-syndrome among irradiated persons: 1) intense oppression of the activity of the pontine and mesencephalic, in a smaller degree, reticular formation; 2) irritation of thalamic structures; 3) possible intensification of the nucleus caudatum activity; 4) oppression of the cortical activity, most intensive in comparison with other EEG-syndromes. Also, the conducted research confirm a large role of the cortical neurons activity infringement as well as functional condition of subcortical structures in the genesis of the «low-voltage» EEG.