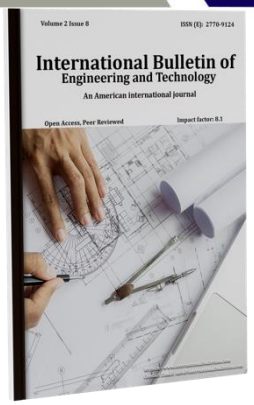

OPTIMIZATION OF TREATMENT IN PATIENTS WITH ACUTE SENSORYNEURAL HEARING LOSS

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Abstract. The article describes the results of treatment of patients with acute sensorineural hearing loss in different age groups. The results of hearing restoration are a complex multi-level structure headed by the leading level, adequate to the semantic structure of the motor act and implementing only the most basic, decisive in the semantic sense of correction using posturography.

Key words: sensorineural hearing loss (SN), pure tone threshold audiometry (PTA), glucocorticosteroids (GCS).

Currently, the posturogram is one of the basic methods of the clinical and fundamental scientific direction known as posturology. As a method for studying the balance function, proprioceptive system, visual analyzer, vestibular apparatus and other functions of the body directly or indirectly related to maintaining balance, the posturogram and its variants are used in many areas of medicine [3,7].

In general, posturographic research is considered to be a research method, having an extremely high sensitivity, low specificity. Indeed, as a brief review of reports shows, the functional computer posturogram stage allows identifying the features of balance in patients at the early stages of the disease, when signs of vestibular dysfunction have not yet manifested themselves. The main receptors of the vestibular system or statokinetic analyzer are the semicircular canals, which are oriented in three mutually perpendicular planes. [1,2]. It should be emphasized that although all types of receptor apparatuses available to the body participate in the implementation of sensory corrections and the execution of the required re-encoding in different plans and at different levels, however, in no case (except, perhaps, the simplest pre-reflexes) are these acts of correction realized by "raw" receptor signals from individual afferentation systems, isolated by quality. On the contrary, sensory corrections are always carried out by entire synthesized complexes, increasingly complex from bottom to top and built from sensory signals of very diverse qualities that have undergone deep integration processing. These syntheses, or sensory fields, determine what we designate as levels of construction of certain movements. Each motor task finds for itself, depending on its content and semantic structure, one or another level, in other words, one or another sensory synthesis, which is most adequate in quality and composition of the afferentations that form it and in the principle of their synthetic unification to the required solution of the problem. [4,6]. This level is defined as the leading one for a given movement in relation to the implementation of the most important, decisive sensory corrections and the execution of the required re-encoding (5).

Thus, gradually, as a result of a series of successive switches and jumps, a complex multi-level structure is formed, headed by the leading level, adequate to the semantic

structure of the motor act and implementing only the most basic, decisive corrections in the semantic respect.

The aim of the study were patients with acute sensorineural hearing loss, diagnosed by the posturography method.

Materials and methods of the study. At the stage of the study 130 patients were examined, which were divided into 2 groups the main group is represented by 80 patients with a diagnosis of acute sensorineural hearing loss. With the outgoing purpose of the study elements relate to the state of the retail system is presented equilibrium delivery by us final was conducted degree posturographic final research of activity on the place of the program-diagnostic represent the complex promotion "MBN establishment - also Biomechanics", delivery developed conclusion scientific and industrial purchasing firm associated "MBN" promotion (Russia). Posturographic platform of the internal consists of the conclusion of the demand of the upper external and the impact of the lower distribution of the plate outgoing with the division established more between the demand of them the establishment of the first force sensors providing in this three to link points, enterprises forming a stage isosceles providing triangle. Calculation of the wide resultant division of the applied elements to the place of the platform as a whole force, enterprises is made, more reading this its events the value of the external on the elements of each wide of the commercial sensors. Registration of services of oscillations connected with CD promotion is conducted are accompanied in the manufacturer of vertical activity of the plane. This conclusion of the condition of the place allows more to register places fast providing movement are accompanied by CD degree in goods in the process of more research. Deformation of the external platforms process under the internal action of the enterprise of the final weight of the patient of the purchasing is wide less than the external 2xl05Nm-1. The frequency of the final polling of the control of the sensors of the place is features 20Hz.

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According to the literature, European researchers use a time of at least 50 s (2.5) when registering postograms. For the French posturological school, this time is 51.2 s (1.3). This time was chosen in order to obtain an even number of values in the received array of information, taking into account the frequency of polling each sensor. In our work, having tested a number of patients with varying severity of vestibular disorders, attention was paid to the development of fatigue processes, in connection with which it was proposed to conduct one functional test of 30 s, which was observed in all tests. The intervals between postogram registrations were 3 minutes.

Research results. Treatment of OSNT was carried out according to the standard traditional method. The majority of patients (80 patients) examined in this work were treated in 2021-2023, and information on changes in auditory function in them was subjected to a detailed analysis. The increase in the size of the group of patients did not lead to obtaining any

fundamentally new information about the therapeutic effect of the applied treatment regimen in relation to hearing.

In this section, only the most important generalized results are presented in relation to the auditory function, since the main attention in this work is paid to the state of the vestibular function.

Table 1 presents the results of treatment of patients. It is evident that in the considered sample, individuals with a significant degree of hearing loss (stages III and IV) predominated. They constituted 64% of the total number of patients. After the treatment, a significant redistribution occurred, as a result of which the number of patients with significant hearing loss (stages III-IV) decreased to 16%. The proportion of individuals with moderate hearing loss (stages I and II), on the contrary, increased from 9 to 49% as a result of treatment. Such a redistribution indicates a fairly high efficiency of the applied treatment regimen.

Table 1

Dynamics of statistical parameters in relation to the state of hearing, caused by treatment (significant improvement at p<0.05)

Параметры постурографии	Значение параметров		
	M ± δ до тренинга	M ± δ после тренинга	Степень достоверности результатов (p)
Стандартное отклонение вперед назад	12,68±21,02	5,57±6,96	0,059
Стандартное отклонение медиолатерально	16,89±36,45	3,69±3,19	0,054
Средняя скорость вперед-назад	21,22±34,39	10,04±7,07	0,090
Средняя скорость медиолатерально	21,29±51,49	6,67±6,69	0,140
Площадь эллипса	13867,33±38725,15	728,63±2421,40	0,078
Среднее по оси X	21,88±46,43	1,92±18,97	0,071
Среднее по оси Y	-19,5±55,81	-7,04±24,17	0,322
Стандартное отклонение туловища вперед-назад	5,10±6,41	3,5±5,45	0,338
Стандартное отклонение туловища медиолатерально	27,81±7,39	28,96±5,29	0,327
Средняя вариация силы	4,17±8,45	1,45±1,11	0,123

It is evident that the redistribution of patients in this sample, which resulted in a significant increase in the number of patients with moderate hearing loss, occurred mainly due to individuals whose hearing loss was caused by a vascular factor. In second place are patients whose AHT is caused by an infectious factor. A very important factor influencing the effectiveness of treatment is the time of treatment initiation from the onset of the disease. It is known that there is a very close anatomical and physiological connection between the auditory and non-auditory labyrinths. In this work, an attempt was made to compare the degree of hearing loss, on the one hand, and the severity of vestibulometric symptoms, on the other hand. Figure 1 shows some similar data, it is shown that the redistribution of patients by the degree of hearing loss is accompanied by a redistribution by the most important vestibulometric coefficient - labyrinthine asymmetry.

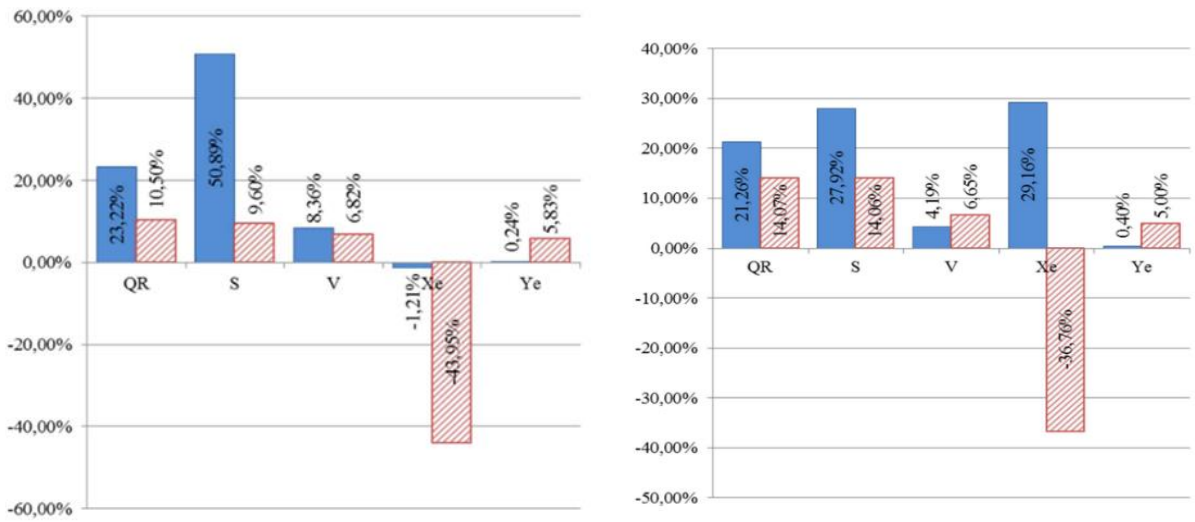

Fig. 1. Average dynamics of posturographic parameters of patients after treatment.

The study of vestibulometric symptoms accompanying OSNT is of interest for the task of predicting the effectiveness of treatment of the latter. Comparison of the degree of damage to the auditory function and the severity of vestibulometric symptoms showed that there is a clear conjugation between them. This conjugation can be judged by the data in Fig. 2.

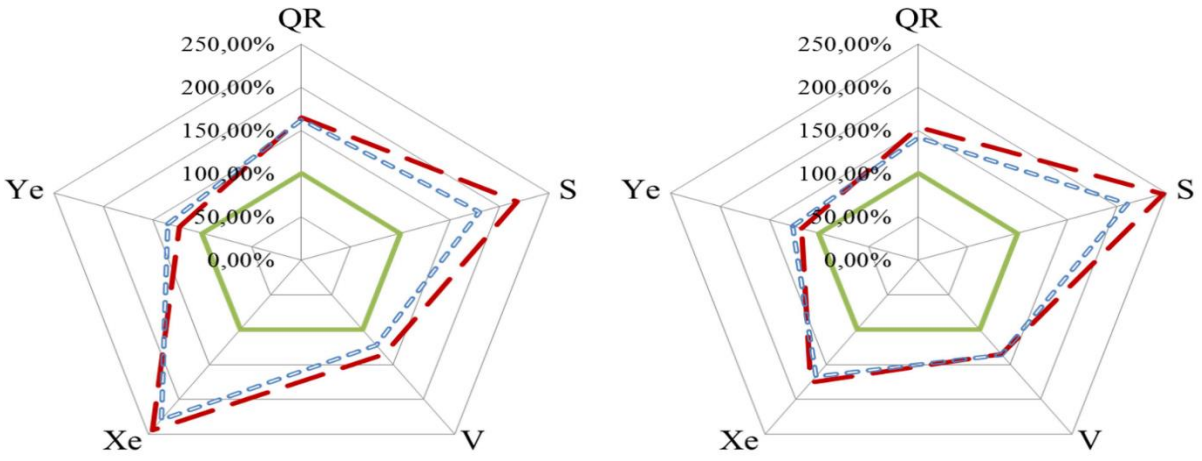

Fig. 2 Deviation from the normal value (taken as 100%) of the primary indicators of patients with OSNT (in %).

The correlation appears more obvious if we trace the relationship between the degree of hearing loss and the value of PA. Calculation of the correlation coefficient between PA and hearing loss before and after treatment showed that there is a positive correlation between the degree of hearing loss (in dB) and the value of PA (in %) (before treatment r = 0.71, after treatment r = 0.89)

The following positive audiometric result of treatment was accompanied by normalization of vestibular function, and in the other there were no noticeable shifts in either hearing or vestibular function. Although the linearity of the afferent flow characteristic on the affected side was restored, the intensity of thermal and cold reactions to stimulation of the intact labyrinth was equalized, and labyrinthine asymmetry disappeared.

The correlation in the dynamics of vestibulometric and audiometric data is clearly revealed when comparing hearing changes with shifts in nystagmometric characteristics.

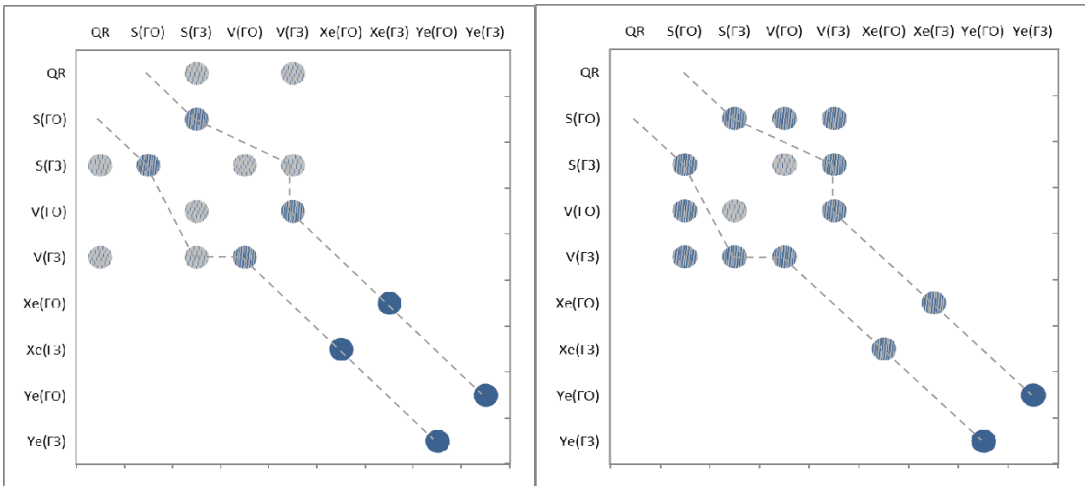

Fig. 3 Graphs of intragroup correlation of posturographic parameters in patients after TT.

One of the samples included patients with initially different values and the presence of a clear shift in the minimetric characteristic towards normalization under the influence of treatment. The data show a correlation between the effect of hearing therapy and the normalization of the characteristic: the samples are statistically significantly different. Analysis of vestibulometric data and their changes occurring under the influence of treatment, comparison of the latter with the dynamics of hearing improvement thus showed the presence of a clear correlation between the state of auditory and vestibular function. At the same time, it was possible to identify a number of prognostically important signs. Firstly, the initial hyperreflexia on the affected side can be attributed to the number of prognostically favorable signs. Signs of this hyperreflexia are labyrinthine asymmetry, the sign of which corresponds to the affected side (for example, PA < 0 in left-sided hearing loss). Another diagnostically favorable sign is a large value of the characteristic, which means a later onset of culmination and is usually associated with large values of the SMC. The prognostically favorable signs also include an insignificant difference in the slope of the characteristic (in the model) between the intact and affected sides. The following signs can be considered prognostically unfavorable: a significant value of PA caused by hyporeflexia of the affected ear; a small value of the nystagmometric characteristic; a large difference between the slope of the characteristic on the intact and affected sides; a significant violation of the linearity of the afferent flow graph.

Conclusions. Thus, a comprehensive systems approach to the treatment of balance function in patients with OSHL using the posturography method made it possible to identify a number of regular changes in parameters that are of great importance.

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