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Evaluation of the Effectiveness of Treatment of Patients with Acute Sensorineural Hearing Loss

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Annotation: The article describes the results of treatment of patients with acute sensorineural hearing loss of different age groups. The results of hearing restoration depending on the cause of neurosensory disturbance, the timing of treatment and the ways of introducing glucocorticosteroids were analyzed.

Keywords: neurosensory hearing loss (NO), tonal threshold audiometry (TBA), glucocorticosteroids (GCS).

Introduction: The problem of neurosensory hearing loss (NO) has been relevant for many decades. Every year, the number of patients with ONO is growing due to the increasing urbanization of the population, the acceleration of the pace of life, the increased exposure to toxic environmental and industrial factors, noise and vibration, as well as the increase in the incidence of cardiovascular diseases.

[1,4]. Patients with impaired inflammatory function despite the introduction of advanced technologies in the field of diagnosis , treatment and rehabilitation , the etiopathogenesis mechanisms of this disease have not been fully studied, for the treatment of this pathology The search for new, more effective drugs and their combinations is still ongoing . According to various sources, from 1% to 6% of the world's population suffers from severe forms of dementia , which are mainly caused by neurosensory damage and reach 75-95% of the population. [1,3,5]. NO is more common in people of working age, for whom hearing loss is the most important decrease The social disadvantage associated with it can significantly reduce the quality of life, limit the fulfillment of usual obligations , and even force them to change their type of work.

NO often occurs as a result of impaired blood circulation in the inner ear system due to vascular pathology, the toxic effects of viral infections, allergic and inflammatory edema, and is accompanied by a decrease in the level of oxygen in the tissues and metabolic disorders in the neuroepithelial cells of the cochlea . Under conditions of hypoxia, the level of free radicals

increases, which allows the activation and release of lytic enzymes that damage certain cell membranes , resulting in the destruction of various components in nerve cells . Long -term ischemic foci of nerve fiber contribute to its atrophy and subsequent replacement with connective tissue. Therefore, it is necessary to quickly eliminate the damaging effects of hypoxia and inflammation in the inner ear system , as well as improve the delivery of oxygen and nutrients to the damaged foci , which will prevent the formation of permanent and irreversible changes in the receptor apparatus . [2,4].

To date, a large number of drugs , regimens and non-drug methods of treatment are used for the treatment of N. Treatment with glucocorticosteroids (GCS) is considered the most rational and effective, since they are the most powerful natural antioxidants, which reduce vasoconstriction and the exudative and proliferative phases of inflammation . quickly stops swelling and inflammation due to this condition the closed bony cavity of the inner ear is also of particular importance [3]. It has been proven the effectiveness of hyperbaric oxygenation (GBO), which allows to compensate for the lack of oxygen in conditions of impaired local blood flow . During the treatment, restoration of microcirculation and improvement of rheological properties of blood , as well as regulation of hemodynamics in the vertebrobasilar basin It is very important, for this purpose, drugs affecting microcirculatory flow, which are considered one of the important pathogenetic components of NO treatment, and physiotherapeutic methods are successfully used . In the shell MAT metabolites, anti hypoxants and antioxidants , vitamin complexes are used to normalize metabolic processes [1,4,5].

Materials and methods:

We have experience in treating 369 patients over 18 years of age with acute sensorineural hearing loss . The number of women (210 ears) and men (203 ears) with sensorineural hearing loss (SNHL) was 186, 46 of whom had bilateral hearing loss (20 men and 24 women). Our study analyzed 413 cases , of which 186 were women (210 ears) and 183 men (203 ears). corresponds to the number of damaged ears .

The average age of the observed patients was 47.10±13.53 years . The total number of observations was divided into age groups according to WHO classification . Middle-aged patients (45-60 years old) predominated in 191 observations , young patients (20-45 years old) were identified in 153 observations , in the elderly age group (60-75 years old) NO was recorded in 69 cases . To more thoroughly analyze the most common causes of this disease, as well as the nature of its progression and recovery , patients were divided into age groups.

inclusion criteria for the study were : neurosensory type of audiometric curve with an increase in the threshold of sound perception at speech frequencies by more than 26 dB , the duration of the disease did not exceed 1 month . The study excluded patients with middle ear pathology, intracranial formations of the brain and cerebellar-pontine angle , oncological diseases, pregnant women, as well as patients with acute sensorineural hearing loss with an increase in the threshold of sound perception up to 26 dB .

All patients underwent audiological examination at the beginning of treatment and after the full course of treatment : acumetry, impedance ometry and tonal threshold audiometry . The degree of severity was determined by the average values of sound perception thresholds at frequencies of 500, 1000, 2000 and 4000 GHz according to the WHO classification . The 1st level of severity corresponds to an increase in the threshold by 26-40 dB, the 2nd level by 41-55 dB, the 3rd level by 56-70 dB, the 4th level by 71-90 dB , perception an increase in the hearing threshold of 91 dB corresponded to practical deafness .

At the time of admission to the hospital, all patients had hearing loss noted a decrease in 73.61 % of patients The affected ear was closed , in 96.61% of cases, noise of various nature was observed , 25.91% of patients complained of dizziness and vestibular disorders (14.77%). During the observation period, the patients underwent a general clinical laboratory examination, a neurologist, an ophthalmologist The necessary examination was performed , including an X- ray examination

of the skull bones and an MRI of the brain in case of suspicion of intracranial masses and vascular pathology .

Results and discussion:

The study determined the time of referral of patients from the onset of the disease in different age groups (Table 1). The table shows that the most socially active patients of working age, that is, young and middle-aged patients (groups 1 and 2), are more likely to seek specialized care than older patients . I should have applied earlier .

1. Duration of hospitalization for treatment of patients of different ages

Application time	1 group	2 groups	3 groups	Total number
7 days	96(62.75%)	100(52.37%)	32(46.38%)	228(55.20%)
14 days	31(20.26%)	49(25.65%)	24(34.78%)	104(25.18%)
21 days	23(15.03%)	29(15.18%)	9(13.04%)	61(14.78%)
Up to 1 month	3(1.96%)	13(6.80%)	4(5.80%)	20(4.84%)
Total :	**153 (100%)**	**191(100%)**	**69(100%)**	**413(100%)**

likely causes of acute neurosensory disorders were identified. The most common cause of the development of NO was vascular disorders (46.01% of cases) . Complaints against the background of high blood pressure appeared in 28.33% of patients , high blood pressure was most often the cause of NO in the 2nd and 3rd age groups and amounted to 39.27% and 40.57% , respectively , in group 1 this figure amounted to 20.75% of all observations, hypotension was noted in 3.38 % of the total number of patients . Acute hearing loss with a short-term increase in blood pressure after stress was observed more often in patients of the 1st and 2nd age groups , which amounted to 14.38% and 15.10% , respectively . During subsequent examinations, diseases of the cardiovascular system of various nature were detected in 75.67% of patients, including ischemic heart disease and atherosclerosis of the cerebral vessels, arterial hypertension , circulatory disorders in the vertebrobasilar system, dyscirculatory encephalopathy, vegetative - vascular dystonia, hypotension, diabetes mellitus and diabetic angiopathy , etc.

The second place in the development of NO is occupied by acute respiratory viral infections (ARVI), which accounted for 21.31 % of all applicants . No statistical differences were found in the occurrence of NO in different age groups after O' RVI . In our study, idiopathic hearing loss accounted for 18.46% of cases , and even after a comprehensive examination, it was not possible to determine the probable cause of the disorder . Most often, such cases were observed in the 1st and 2nd age groups , 22 (37.2%) and 29 (24.61%) people , respectively , including 15.12% and 4.11% of cases immediately after waking up. appeared in 8.2% of all observations corresponded to the share of acute hearing impairment against the background of acoustic and barotrauma . The remaining cases of N O were 6.02 (Fig. 1).

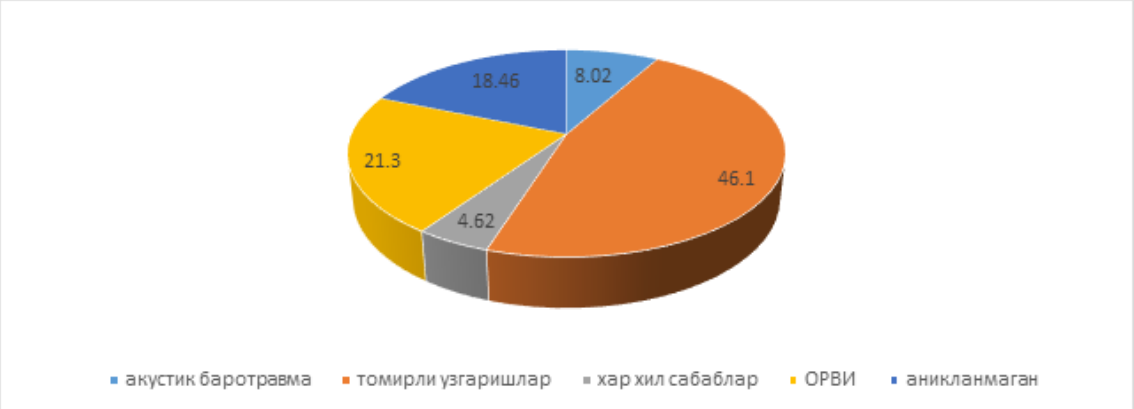

Figure 1 . Possible causes of NO occurrence

In the structure of severity , the 1st level of hearing loss prevailed in all age groups, but the share of severe 3-4 degrees of hearing loss in the general structure was significant : in the 1st group - 37.90 %, in the 2nd group - 36.65%, in the 3rd group in the group - 34.78%. in groups 1 - , 2 - and 3 In patients , 60.13%, 64.4% and 61.52% of patients had significant hearing impairment (Fig. 2).

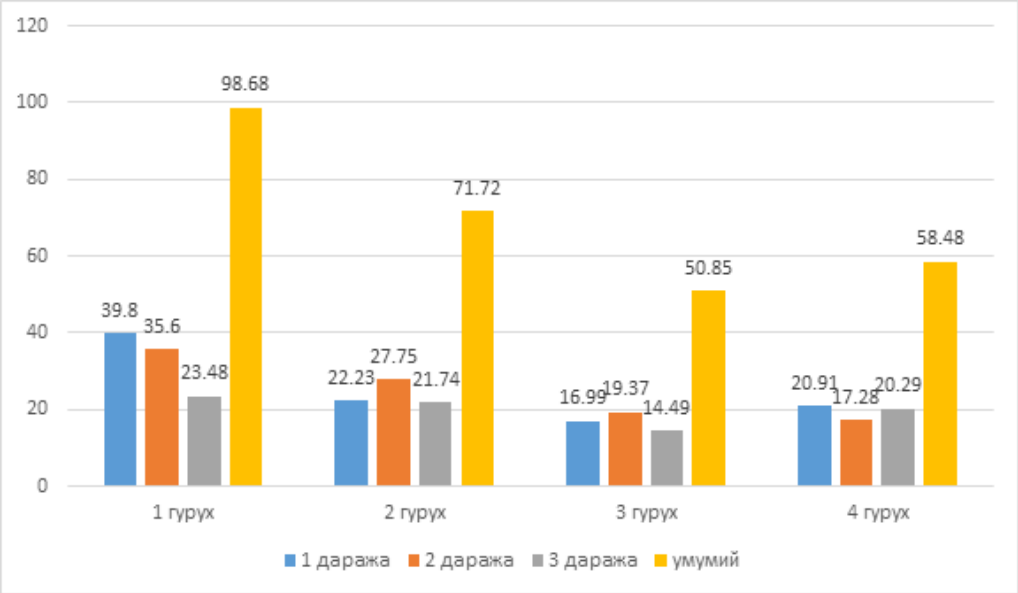

Figure 2 . Distribution of patients according to severity in different age groups

patients with NO were treated in accordance with the basic principles of treating patients with this pathology : immediate hospitalization in a specialized hospital or day unit , and immediate initiation of complex therapy. The goal of treatment is to restore hearing to age-appropriate levels or to improve it by lowering perception thresholds, especially in the speech frequency ranges of 500-1000-2000-4000 Hz . significantly improve, reduce the intensity of noise, or get rid of it and elimination of vestibular disorders .

In our study, comprehensive treatment included:

- ✓ Dehydration therapy (mannitol)
- ✓ Microcirculatory drugs (pentoxifylline , piracetam)
- ✓ Glucocorticosteroids (dexamethasone)
- ✓ Antioxidants and MAT metabolites (emoxipin, mexibel, cytoflavin)
- ✓ Antihistamine drugs (betaserc)
- ✓ GBO, reflexotherapy with needles , physiotherapy treatment.

hearing-improving therapy are determined by the timing of the start of treatment, an integrated approach to the appointment of drugs. In the treatment of NO , we actively used GCS as a powerful natural antioxidant and anti-inflammatory agent (in 79.66% of cases) , for this purpose we used a solution of dexamethasone 0.1 mg per 1 kg of body weight parenterally for an average of 5 days . The drug was also not used in patients with contraindications to the systemic use of hormones and severe somatic pathologies . We also used the method of intratympanic administration of GCS in 92 patients with NO of different age groups .

In our study, hearing improvement was noted in 305 (73.85%) cases, of which 253 (61.26%) hearing corresponded to normal values and 1st degree of severity , in 125 (30.27%) cases, sound perception was improved. normal The rate of hearing recovery in men and women was approximately the same . In 25.67% of cases, no change in hearing thresholds was observed, and in 2 patients , a decrease in hearing was observed against the background of the treatment . Reduction of noise intensity and getting rid of it was found in 81.60% of cases , tinnitus completely

disappeared in 68.75% , vestibular manifestations and dizziness remained in 5 and 6 people, respectively , after the course of treatment . continued in an outpatient setting.

reasons, recovery of hearing ability was analyzed in a set of general observations . The following results were obtained : after the ORVI, various levels of hearing improvement occurred in 90.91% of cases , and in 79.55% of cases, sound perception corresponded to normal hearing and 1st degree of hearing loss . thresholds have been reached. Recovery is worse in patients with vascular pathology , that is, 64.9% were in the condition , the level of hearing corresponding to the 1st level of severe hearing loss and the level of normal perception of sound was noted in 50.33% . In cases of ON associated with acoustic and barotrauma, improvement in hearing was observed in 82.05% of cases, and in cases of idiopathic deafness, which is characterized by an unspecified nature of the disorder , improvement occurred in 73.50 % of cases .

A treatment analysis was conducted for patients who sought help in late periods, that is, for more than 2 weeks. In the group of young patients, hearing ability did not change dynamically in 38.46% of cases against the background of complex treatment, among them, 3-4 degree of severity was observed in 19.23%. In the middle-aged group, the number of unsatisfactory results of treatment was equal to the cases of hearing improvement, but it should be noted that the auditory dynamics remained unchanged in patients with severe hearing loss. In elderly patients, 46.15% of cases did not improve, 30.77% of cases had severe hearing loss.

the average values of sound perception thresholds in different age groups at speech frequencies at the beginning of the treatment (BO'Q 1) and after the complex therapy (BO'Q 2) , and then we evaluated the level of improvement of the hearing thresholds according to the difference of the average indicators (BO'QYa = BO'Q 1 - BOQ 2) . (Table 2) According to the data in the table, it can be seen that the reduction of hearing thresholds was similar in all age groups at the same average frequency .

Table 2. Average value of sound perception thresholds at speech frequencies in patients with NO before and after treatment in different age groups

Frequency Group	500 Hz	1000Hz	2000Hz	4000Hz
1 - gur., BOX 1	42.91±27.23	63.74±27.33	65.93±23.81	66.93±23.92
1 - gur., BOX 2	29.42±25.96	43.45±30.53	49.37±31.65	54.76±39.65
1st group , BOK Yes	13.49±26.54	20.29±28.93	16.61±7.84	12.17±28.93
2nd group , 1st group	40.09±25.89	62.63±26.89	64.16±33.22	62.21±20.19
2nd group , 2nd group	29.08±25.39	42.63±29.69	44.84±27.48	49.40±12.81
2nd group , BOK Yes	12.00±26.54	19.96±29.02	16.28±27.76	12.17±31.74
3rd group , 1st group	42.78±27.30	42.78±27.3	42.78±27.3	42.78±27.3
3rd group , 2nd group	29.60±26.16	42.78±27.3	42.78±27.3	42.78±27.3
3rd group , BOK Yes	13.18±26.73	18.78±28.95	16.33±27.68	11.92±31.60

In addition, we are traditional medicine We analyzed the mean hearing thresholds before and after treatment of patients with NO who underwent a course of intratympanic administration of dexamethasone . We compared the results with the results of treatment of the general group in the

follow-up period . The data are presented in Figure 3 .

Note: The index "D" indicates the group of patients who received intratympanic administration of GCS .

Thus, it is clearly seen that intratympanic administration of GCS significantly reduced the thresholds of sound perception at all frequencies .

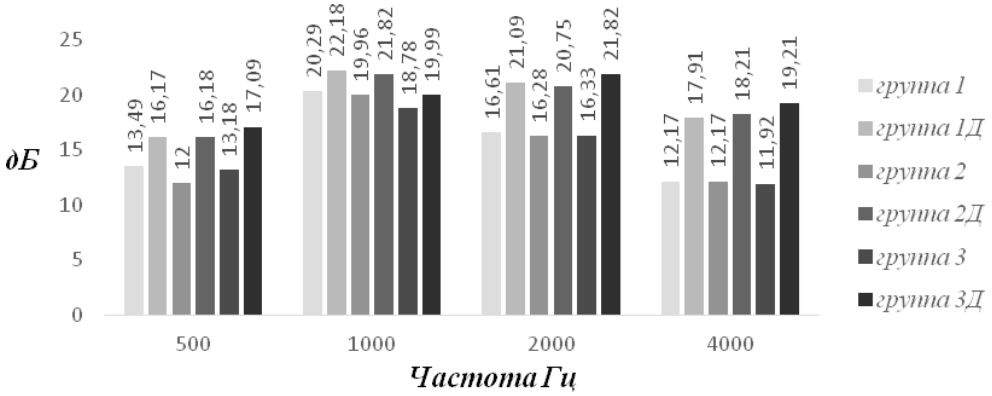

Figure 3. Improving hearing ability in different age groups average values of thresholds .

Discussion

The study highlights critical insights into the treatment and outcomes of acute sensorineural hearing loss (NO) across different age groups. The findings confirm that early intervention is paramount, as the highest rates of hearing restoration were observed in patients who received treatment within the first 14 days of symptom onset. This underscores the importance of prompt diagnosis and immediate initiation of therapy, particularly in younger and middle-aged individuals, who demonstrated better recovery rates compared to elderly patients.

The most prevalent cause of NO was vascular disorders, particularly in middle-aged and elderly patients. This aligns with existing literature suggesting that vascular pathology, including hypertension and ischemic events, significantly contributes to the development of hearing loss. Patients with vascular-related NO exhibited slower and less complete recovery compared to those with NO caused by infections or trauma. This finding emphasizes the need for targeted treatments addressing underlying vascular risk factors.

The intratympanic administration of glucocorticosteroids (GCS) proved to be highly effective, leading to significant improvements in hearing thresholds at speech frequencies. This method allowed for localized anti-inflammatory and antioxidant effects, reducing the risk of systemic complications. These findings are consistent with studies reporting the superiority of intratympanic GCS in cases of refractory or severe NO.

Despite the overall success of the treatment protocol, certain cases showed limited improvement. Delayed referrals, severe initial hearing loss, and comorbid conditions such as diabetes and cardiovascular disease were identified as key factors limiting treatment efficacy. Additionally, idiopathic NO cases presented unique challenges, as the lack of identifiable causes hindered the customization of therapy.

This study also highlights the multifactorial nature of NO, as evidenced by the diverse etiological spectrum. The role of acute respiratory infections, acoustic trauma, and idiopathic factors in younger patients suggests that environmental and occupational exposures, along with individual health profiles, significantly influence disease onset and progression.

Strengths of this study include the large sample size and the comprehensive analysis of both clinical and therapeutic variables. However, limitations include the lack of long-term follow-up to assess sustained recovery and the absence of advanced genetic or molecular analysis to further elucidate idiopathic cases. Future research should focus on exploring the molecular pathways

underlying NO and evaluating novel therapeutic strategies, such as combination therapies or advanced delivery systems for drugs.

In conclusion, this study underscores the importance of timely, individualized treatment for NO, particularly in addressing vascular and idiopathic causes. Intratympanic GCS administration stands out as a promising approach, offering significant improvements in hearing thresholds. These findings can inform clinical practice and guide future research toward optimizing treatment outcomes for patients with acute sensorineural hearing loss.

Conclusion:

This study demonstrates the significance of timely and comprehensive treatment in improving outcomes for patients with acute sensorineural hearing loss (NO). Early initiation of therapy, particularly within the first 14 days of symptom onset, was shown to be critical in achieving favorable results, with 73.85% of patients experiencing improvement in hearing thresholds. Intratympanic administration of glucocorticosteroids (GCS) proved to be highly effective, especially in addressing severe cases, by delivering targeted anti-inflammatory and antioxidant effects.

The findings highlight the predominant role of vascular disorders as a cause of NO, particularly in middle-aged and elderly patients, and the associated challenges in achieving optimal recovery in this group. Additionally, idiopathic NO and cases linked to acute respiratory infections or trauma demonstrated variable recovery outcomes, further emphasizing the need for individualized treatment strategies.

Despite the overall success of the treatment protocols, delayed referrals and comorbidities such as cardiovascular disease and diabetes were significant barriers to recovery. These factors underscore the importance of raising awareness about early intervention and tailoring treatment plans to address underlying conditions.

In conclusion, this study provides valuable insights into the etiology, treatment, and outcomes of NO, underscoring the importance of prompt diagnosis, targeted interventions, and the use of intratympanic GCS for effective management. Future research should focus on long-term outcomes and exploring innovative therapeutic approaches to further enhance recovery in patients with NO.

References:

1. Atanesyan AG (2014) Sovremennye trends in treatment astrologer neurosensory tugouhosti [Modern trends in the treatment of acute sensorineural hearing loss]. Consiliummedicum, no. 11, pp. 57-63.
2. Conlin AE, Parnes LS. (2007) Treatment of sudden sensorineural hearing loss. Arch Otolaryngol Head Neck Surg, vol. 133, No. 6, pp. 573–581.
3. KosyakovS.Ya., Atanesyan AG (2006) Intratympanal'noevvedeniesteroidrv v lecheniostrojsensonevral'nojtug ouhosti[Intratympanic introduction of glucocorticosteroids in the treatment of acute sensorineural hearing loss]. Vestnicotorinolar, No. 5, pp.158-159.
4. Kunel'skaya NL, Polyakova TS (2006) Nejrosensornaya tugouhost'. Principylecheniya [Sensorineural hearing loss. Principles of treatment]. Vestnicotorinolar, No. 5, pp.161-163.
5. Nasretdinova MT, Karabaev HE, Sharafova IA Application of methodologies of diagnostics for patients with dizziness //CENTRAL ASIAN JOURNAL OF MEDICAL AND NATURAL SCIENCES. - 2020. - T. 1. – no. 1. - S. 29-33.
6. Nasretdinova MT, Karabaev HE Vestibular neuronitis-the problem of systemic dizziness //European scientific review. - 2019. - T. 2. – no. 1-2.