



Audiological Indicators of Exudative Otitis Media in Benign Neoplasms of the Nose, Paranasal Sinuses and Nasopharynx

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Abstract: In recent decades, many authors have noted an increase in the incidence of exudative otitis media, and it is 15-17% among all ear diseases. To date, the diagnosis and treatment of exudative otitis media in neoplasms of the nose, paranasal sinuses and nasopharynx have been little studied. The relationship between diseases, in particular between inflammatory in the auditory tube and tumor processes, their comorbidity, is not taken into account. This, to some extent, explains the high frequency of medical errors.

The above data indicate that the optimization of the diagnosis of exudative otitis media in neoplasms of the nose, paranasal sinuses and nasopharynx remains one of the leading tasks of otorhinolaryngological practice.

Keywords: exudative otitis media, neoplasms of the nose, paranasal sinuses and nasopharynx, patency of the auditory tube, audiometry, tympanometry.

Introduction. According to statistics, ear diseases occupy the second place in the structure of general otorhinolaryngological pathology, second only to diseases of the nose and paranasal sinuses. Most ear diseases are accompanied by the development of various types of hearing loss, which worries the patient not only in the acute period of the disease, but also becomes chronic. The social significance of the treatment of this pathology is given by the fact that more than half of all patients with hearing loss are of working age [1,3,4]

EOM is a polyetiological disease, often due to a combination of several causative factors. The impact on the mucous membrane of the middle ear is not only infectious factors, but also physical (barometric pressure drops), chemical (gastroesophageal reflux) and biological (nasopharyngeal tumors), and especially their combination leads to the development of EOM [2,5].

Materials and research methods. The basis of the research work was the results of the examination and complex treatment of 103 patients with exudative otitis media who applied to the department of otorhinolaryngology of the 1st clinic of the Samarkand State Medical Institute in the period from 2018 to 2021. In our work, we used the following criteria for selecting patients: clinical symptoms - complaints of hearing loss, tinnitus, a feeling of "stiffness" of the ear, sensations of "liquid transfusion" in the ear; otoscopic data: cloudy, altered tympanic membrane - there is retraction or swelling, the presence of a liquid level and the presence of air bubbles in the tympanic cavity; hearing loss according to the conclusion of threshold tone audiometry; pathological types of

tympanograms type B.

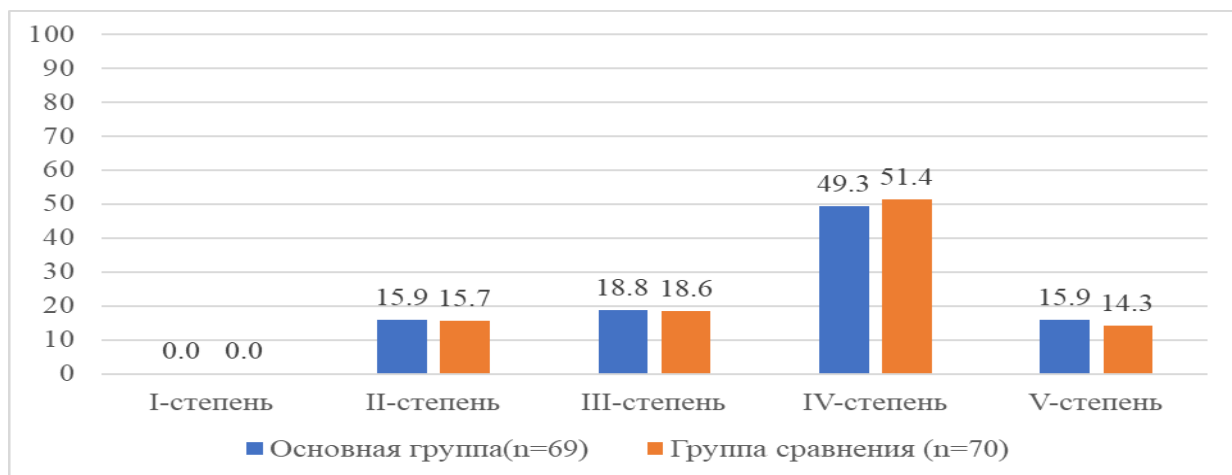
Two groups were distinguished: 55 patients with exudative otitis media (EOM) with benign neoplasms of the nose (BNN), paranasal sinuses (PNS) and nasopharynx (NP) constituted the I main group, 48 patients with exudative otitis media with chronic rhinosinusitis (CRS) - II comparison group.

The audiological examination included pure tone audiometry with detailed analysis of air and bone conduction, air-bone gap and tympanometry.

The results of the survey and their discussion.

The results of assessing the degree of patency of the auditory tube in patients with benign neoplasms of the nose, paranasal sinuses and nasopharynx and with chronic rhinosinusitis are shown in Figure-1.

Figure -1.



Distribution of patients with EOM according to the degree of patency of the auditory tube (each ear was assessed separately)

In patients with BNN, PNS and NP, degree II patency of the auditory tube was observed in 15.9% of cases, degree III - in 18.8%, degree IV - in 49.3%, degree V - in 15.9%. With EOM in CRS, the II degree of eustachian tube patency was recorded in 15.7% of patients, the III degree - in 18.6%, the IV degree - in 51.4%, the V degree - in 14.3%. There was no significant difference between the frequencies of detection of various degrees of eustachian tube patency in patients with benign neoplasms and chronic rhinosinusitis before treatment.

According to the generally accepted classification of hearing loss in patients during the initial examination, conductive and mixed forms of hearing loss were noted (table-1).

Table -1. Audiological indicators

Audiological indicators	EOM in BNN, PNS and NP* (n=69)	EOM at CRS* (n=70)	Criterion X^2 P-value
Conductive hearing loss	65/94,2%	70/100%	0.71
I	27/39,1%	48/68,6%	<0.001
II	36/52,2%	20/28,5%	<0.001
III	2/2,9%	2/2,9%	0.94
Mixed hearing loss	4/5,8%	-	NA
I	3/4,3%	-	NA
II	1/1,5%	-	NA

Note: * - each ear was evaluated separately.

In patients with EOM with BNN, PNS, and NP, hearing impairment is observed as a conductive type of 94.2%, and a mixed type of 5.8%, in contrast to the EOM group with CRS, where only a

conductive type of hearing loss occurs 100%. Patients with EOM with BNN, PNS and NP are significantly more likely to have II degree of hearing loss (52.2%), patients with EOM with CRS I degree of hearing loss (68.6%).

The parameters of the patients' auditory function were subjected to a detailed analysis: the values of bone and air conduction at speech frequencies (500, 1000, 2000 and 4000 Hz), as well as the bone-air interval were studied.

Table 2 presents the data of threshold audiometry in the groups of examined patients.

Table -2. The results of tone threshold audiometry, dB (M±m)

Frequency Hz		EOM in BNN, PNS and NP* (n=69)	EOM at CRS* (n=70)	Mann-Whitney Criterion P-value
Air conduction	500	43,59±4,83	35,26±5,21	<0,001
	1000	45,81±3,72	32,43±3,76	<0,001
	2000	45,11±4,98	31,19±4,21	<0,001
	4000	43,79±3,94	31,48±3,83	<0,001
Bone conduction	500	10,83±1,11	8,28±0,81	0,03
	1000	11,79±0,84	10,94±1,33	0,44
	2000	13,59±0,76	12,29±0,73	0,19
	4000	12,49±0,71	11,69±0,93	0,05

Note: p - significance level of differences, * - each ear was evaluated separately.

Attention is drawn to the differences between the compared groups in terms of air conduction at all studied frequencies: the thresholds for the perception of sounds in the air are on average 1.4 times higher in patients with EOM against the background of benign neoplasms, which is explained by more pronounced pathological changes in this pathology.

In the analysis of bone conduction, a significant difference in indicators at a frequency of 500 Hz was noted.

One of the mandatory indicators that are analyzed in conductive hearing loss is the air-bone interval (table-3).

Table -3. The results of the measurement of the air-bone interval, dB (M±m)

Frequency Hz	EOM in BNN, PNS and NP (n=69)	EOM at CRS (n=70)	Mann-Whitney Criterion P-value
500	32,76±3,81	26,98±3,89	<0.001
1000	34,02±3,44	21,49±3,71	<0.001
2000	31,52±3,74	18,90±4,01	<0.001
4000	31,3±3,59	19,79±3,72	<0.001

Note: p - significance level of differences, * - each ear was evaluated separately.

The value of the air-bone interval before treatment in the examined patients differed significantly. The average values of the air-bone interval in patients with EOM with benign neoplasms were 1.5 times higher on average.

Tympanometry is considered an important diagnostic technique for exudative otitis media. The criterion for selecting patients was a pathological tympanogram of type B; accordingly, we did not reveal any differences in the main and comparison groups.

Conclusion

Audiological indicators of exudative otitis media in benign neoplasms of the nose, paranasal sinuses and nasopharynx are characterized by more pronounced pathological changes, which is associated with the comorbidity of the disease, a longer and more severe course of the underlying disease.

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