



## "INNOVATIVE ACHIEVEMENTS IN SCIENCE 2024"

### DIAGNOSTIC INFORMATIVITY OF THE DRUGS USED TO REVEAL INTRALABYRINTHINE HYDROPS ACCORDING TO THE DATA OF AUDIOLOGIC AND BIOCHEMICAL STUDIES

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**Abstract:** *Due to the fact that until now the question of interpretation of the results of dehydration tests, the frequency of detection of intralabyrinthine hydrops and the percentage of coincidence of data when using different drugs remains controversial, it seems important to study the diagnostic informativeness of drugs used in clinical audiology.*

The variability of the obtained results can be explained by the use of different dosages of the same drug, lack of control over the changes in blood biochemical parameters, mainly osmolarity, which determines the dehydration effect, as well as different interpretation of changes in auditory thresholds during dehydration tests.

The task of the present work was to determine the informativeness of the dehydrating ability of glycerol, furosemide, glucose and xylitol on the basis of changes (increase or decrease) in auditory thresholds, confirmed by a reliable change in blood serum osmolarity after their administration. In our work we were guided by the interpretation of the results of dehydration tests and methods of determining biochemical parameters (potassium, sodium, glucose, total protein and serum osmolarity), described in detail earlier (2,3).

The aim of the study was to determine the informativeness of the preparations used to detect intralabyrinthine hydrops based on audiologic examination.

**Materials and Methods:** We examined 96 individuals aged 23 to 42 years (men - 41, women - 55) suffering from Meniere's disease for 3-15 years. All patients underwent glycerol test (in doses of 0.6 and 1.5 g/kg of weight). Other tests were performed before (5-7 days before) or after (5-7 days after) glycerol administration. In each case, the indication for the tests was the need to diagnose cochlear hydrops



**"INNOVATIVE ACHIEVEMENTS IN SCIENCE 2024"**

or hydrops of the non-auditory part of the labyrinth. The standard glucose tolerance test (SGTT) was used to detect possible disorders of carbohydrate metabolism. Furosemide was administered intramuscularly at a dose of 20 mg once daily. The presence of deficiencies in each of the drugs used led to the need to test a new agent - xylitol. Xylitol (in doses of 0.75 and 1.5 g/kg wt) was dissolved in water and lemon juice was added to improve the taste. The total volume of the mixture was 250 ml. Glycerol, glucose and xylitol were given once in the morning, on an empty stomach.

**Table 1**

Change in serum biochemical parameters after single administration of different dehydration drugs 120 min after administration

The drug	Biochemical parameters of blood serum				
	Kaliy mEq/L	Natriy mEq/L	Sugar mg%	total protein g/l	Osmolarity mosm/kg
Control n=40	4,64±0,09	135,7±1,24	81,9±1,75	7,28±0,12	293,0±1,60
Glycerol 0,6г/кг n=41(men)	4,52±0,09	135,6±1,51	89,9±1,8	6,91±0,17	289,2±1,80
1,5g/kg	5,16±0,21	142,8±2,39	93,6±2,60	7,46±1,16	314,0±2,90
n=55(women)	p<0,001	p<0,05	p<0,01		p<0,001
Glucose 1,5g/kg n=20	4,23±0,30	138,5±2,03	153,0±8,3	6,80±0,21	282,0±2,70
Furosemid 20 mg n=40	4,28±0,31	131,1±2,57	89,7±3,20	89,7±3,20	284,0±3,20
Xylit 0,75g/kg n=20	5,14±0,11	140,0±1,14	96,8±2,01	7,62±1,00	300,7±2,10
1,5g/kg n=20	5,29±0,14	143,5±1,54	101,7±2,33	7,94±1,15	316,6±2,60
	p<0,001	p<0,01	p<0,001		p<0,001

The results of biochemical studies in 40 practically healthy individuals of the same age group were taken as control indicators. Audiometric control was carried out using conventional tonal threshold audiometry. Changes in audiometric and biochemical parameters were determined 30, 60, 120 and 180 min after the drug administration. Table 1 presents the results of maximum changes in serum biochemical parameters observed 120 min after drug administration.

**Table 2**

presents the absolute values of changes in auditory tone thresholds at 60, 120 and 180 min after dehydration.

The drug	Dose	Change in auditory thresholds through			Change in hearing thresholds in dB	informativeness of changes in hearing thresholds



**"INNOVATIVE ACHIEVEMENTS IN SCIENCE 2024"**

		60 min	120 min	180 min		
Control	-	-	-	-	4,0 $\pm$ 0,46	physiological
Glycerol	0,6 g/kg	-	$\pm$	$\pm$	4,5 $\pm$ 0,80	fluctuations
	1,5 g/kg	-	++	+++	13,2 $\pm$ 1,70	80%
Glucose	1,5 g/kg	$\pm$	+	$\pm$	5,7 $\pm$ 1,79	30%
Furosemid	20 mg	$\pm$	+	$\pm$	7,3 $\pm$ 1,06	40%
Xylit	0,75 g/kg	++	+++	++	12,8 $\pm$ 1,07	70%
	1,5 g/kg	+++	+++	+++	14,5 $\pm$ 2,58	80%

When glycerol was administered at a dose of 0.6 g/kg, serum biochemical parameters and auditory thresholds changed insignificantly, whereas glycerol administration at a dose of 1.5 g/kg caused an increase in potassium, sodium, total protein and osmolarity in 50 of 55 patients 1 h after administration. These changes reached their maximum value in 2 h and remained at this level until 3 h, although they did not exceed the physiologic norm. The analysis of audiometric parameters revealed a reliable change of auditory thresholds in 39 patients in 2 h with maximum changes in 3 h after glycerol administration. When comparing the results of changes in auditory thresholds and serum osmolarity after the drug administration, a proportional relationship between the increase in osmolarity and the change in tonal thresholds was noted. It follows that in the absence of a reliable increase in serum osmolarity, the results of the test, from the audiometric point of view, should be regarded as doubtful.

Thus, the obtained data showed that glycerol at a dose of 1.5 g/kg is effective in detecting hydrops (with lowering of auditory thresholds and improvement of speech intelligibility) in 70% of cases, which complements the results of our previous studies (2,4,5). Reducing this dose is inadvisable, as the reliability of changes in auditory thresholds in all periods of observation decreases. Conducting SGTT allowed us to study the dehydrating effect of glucose and the possibility of using it for diagnostics of hydrops.

The examination of 20 patients showed that ingestion of 1.5 g/kg of glucose causes a decrease in serum potassium level in the majority of patients both after 30 min and after 3 hours. This is probably due to the mobilization of potassium under the action of insulin from extracellular to intracellular fluid (Mendelsohn and Roderigue, 1972). Serum osmolarity increased in 10 patients and decreased in the other 10 after 30 min. After 3 h, osmolarity was unchanged in 5 patients and returned to baseline in the other 15. In most cases, a significant decrease in serum



## "INNOVATIVE ACHIEVEMENTS IN SCIENCE 2024"

potassium level coincided with a decrease in osmolarity and impaired glucose tolerance.

Audiometric study showed that changes in hearing thresholds were observed in 9 patients after 1 h. Changes in hearing thresholds in all periods of observation did not exceed 10 dB, whereas after glycerol administration they reached 25 dB and more. In patients with a significant decrease in potassium level, osmolarity and impaired glucose tolerance no changes in auditory thresholds were observed.

Based on the data obtained, it can be concluded that the dehydrating effect of glucose is much weaker than that of glycerol at a dose of 1.5 g/kg, and that it should be used for dehydration (in the absence of other dehydrating agents or in the presence of contraindications to them) only with normal tolerance and normal serum potassium level. The dehydrating effect of glucose is manifested as early as 1 h after administration.

Furosemide is also used for the diagnosis of intralabyrinthine hydrops (2,4). Being a saluretic, it has a pronounced diuretic effect. In 2 and 3 h after its administration, the protein content in serum increased, whereas the potassium, sodium and osmolarity decreased. The maximum change in these parameters was observed after 2 h in 28 out of 40 patients. Change in auditory thresholds after 2 and 3 h was observed in 22 patients.

Thus, the obtained results show that furosemide is less informative than glycerol at a dose of 1.5 g/kg, but more informative than glucose. However, it should be taken into account that furosemide reduces blood pressure, is contraindicated in patients with kidney disease, low blood potassium, and has ototoxic effects (4,5). The presence of disadvantages in each of the used preparations served as a basis for approbation of dehydrating ability of xylitol. Unlike glucose, xylitol is utilized more slowly, but it has the same energetic, plastic and antitoxic properties, promotes normalization of protein, fat and carbohydrate metabolism and can be used in case of impaired glucose tolerance (4,6). In medical practice, xylitol is used as an energy material in parenteral nutrition in the postoperative period, in diabetes, obesity, as well as a choleric and loosening agent (4,5).

Conclusions: Analysis of the results of the study showed that the most pronounced dehydrating effect has xylitol at a dose of 1.5 g/kg of weight. This dose causes a significant change in all determined biochemical parameters in all periods of observation. The maximum changes were observed 2 h after xylitol administration.

Audiometric determination of changes in auditory thresholds in patients after glycerol and xylitol administration showed that in 1 h after 1.5 g/kg xylitol



## "INNOVATIVE ACHIEVEMENTS IN SCIENCE 2024"

administration the change of auditory thresholds was noted in 15 out of 20 patients, at glycerol administration at a dose of 1.5 g/kg - in 5 out of 20 patients.

Comparative assessment of dehydrating effect of glycerol, glucose, furosemide and xylit used in clinical audiology for assessment of the intralabyrinthine hydrops has shown that diagnostic informativity of glycerol and xylit was considerably higher as compared to that of furosemide and glucose. 1.5 g/kg of xylit produces the change of hearing thresholds in low and middle frequency range comparable to that of glycerol but has no contraindications and side adverse effects inherent to glycerol.

### LIST OF REFERENCES:

14. 1. Avezov M.I., & Xamraev F.X. (2023). Surunkali yiringli otitning jarrohlik amaliyotidan keyingi asoratlarini tashxislash va davolashni takomillashtirish. Universal journal of medical and natural sciences, 1(6), 21–26.
15. Adxamovich X. A. et al. The Diagnosis and Treatment of Paranasal Sinus Cysts //Genius Repository. – 2023. – T. 26. – C. 23-29
16. Balashova A.I.K., Tsinis A.V. methods of conducting exercises for cervical osteochondrosis of the spine //StudNet. – 2022. – T. 5. – No. 6. – pp. 5796-5805.
17. Esankulovich K. H., Taxinovna N. M., Khurramovna K. Z. Auditory adaptation in patients with peripheral and central hearing impairment //Central Asian Journal of Medical and Natural Science. – 2022. – T. 3. – №. 3. – C. 160-164.
18. Jahangir J. M. Clinical and pathogenetic characteristics of stroke development in children of different ages //journal of healthcare and life-science research. – 2024. – T. 3. – №. 5. – C. 1-3.
19. Melyokhin A.I. Remote cognitive-behavioral therapy in the treatment of tinnitus and Meniere's disease // Journal of telemedicine and electronic health care. – 2021. – T. 7. – No. 2. – pp. 31-43.
20. Nasretdinova M., Nabiev O., Vladimirova T. Prospects for the use of Cavinton for the treatment of patients with Meniere's disease // Journal of Dentistry and Craniofacial Research. – 2021. – T. 2. – No. 1. – pp. 27-30.
21. Nasretdinova M., Karabaev H. Diagnostic and prognostic value of the spectrum of subjective ear noise in chronic mesotympanitis // Journal of Dentistry and Craniofacial Research. – 2020. – T. 1. – No. 1. – pp. 65-67.



## "INNOVATIVE ACHIEVEMENTS IN SCIENCE 2024"

22. Nasretdinova M., Nabiev O., Vladimirova T. Prospects for the use of Cavinton for the treatment of patients with Meniere's disease // Journal of Dentistry and Craniofacial Research. – 2021. – Т. 2. – No. 1. – pp. 27-30.
23. Saidakramovich X. U., Abduqaxxorovich D. J., Pulatovich A. U. O'tkir sensonevral garanglikda steroid dori vositalarni nog'ora bo'shlig'iga qo'llanilishini samaradorligini baholash. – 2022.
24. Taxinovna N. M., Murodqosimovich A. E. The use of physiotherapy in patients with hearing impairment and ear noise //Frontline Medical Sciences and Pharmaceutical Journal. – 2022. – Т. 2. – №. 12. – С. 29-36.
25. Xatamov J. A. et al. Comprehensive diagnosis and treatment of chronic purulent otitis media with complications //World Bulletin of Public Health. – 2023. – Т. 28. – С. 73-75
26. Xatamov J. A. et al. Comprehensive diagnosis and treatment of chronic purulent otitis media with complications //World Bulletin of Public Health. – 2023. – Т. 28. – С. 73-75.