

ON THE DYNAMICS OF THE FUNCTIONAL STATE OF THE VESTIBULAR ANALYZER
IN PATIENTS WITH CERVICAL OSTEOCHONDROSIS WITH VERTEBRAL ARTERY
SYNDROME

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Abstract: *The problem of labyrinth syndrome in cervical osteochondrosis (COPD) has not been finally resolved, although in various forms this syndrome is observed in the majority of patients. According to different authors, disorders of inner ear function can occur either as a result of osteophyte irritation of the sympathetic plexus of the vertebral arteries, resulting in spasm of the labyrinthine artery, or as a result of mechanical obstruction of blood flow in the vertebral arteries (compression by osteophytes, atherosclerosis, developmental anomalies).*

Key words: *labyrinth syndrome, vertebral arteries, vestibular analyzer, cervical osteochondrosis.*

Introduction: The problem of labyrinth syndrome in cervical osteochondrosis has not been finally resolved, although in various forms this syndrome is observed in the majority of patients. According to different authors, disorders of inner ear function can occur either as a result of osteophyte irritation of the sympathetic plexus of the vertebral arteries, resulting in spasm of the labyrinthine artery, or as a result of mechanical obstruction of blood flow in the vertebral arteries (compression by osteophytes, atherosclerosis, developmental anomalies).

Materials and Methods: We observed 174 patients of both sexes aged 31-60 years, in whom various types of vertigo were observed in 91.4%, and combinations of vestibular and cochlear disorders in 66% of cases.

The aim of the present work was to study the dynamics of excitability of the ear labyrinths to temperature stimulus depending on the nature of vestibular disorders and the period of the disease. The examined patients were divided into three groups: Group 1 - 68 persons with spontaneous

nystagmus of different degrees; Group 2 - 71 persons with "cervical" nystagmus; Group 3 - 35 patients without any pathologic oculomotor reactions.

Table 1

Standard indices of caloric vestibular nystagmus in patients of subgroup I A and control subjects during the cold test

Indicators studied	Studied indices Standard indices of caloric vestibular nystagmus in subjects					
	X±m		p	X±m		P
	Control	Ipsilateral labyrinth		Control	Contralateral labyrinth	
ΛΠс	26,7 + 0,68	28,7 ±1,06	<0,05	25,8<0,73	22,1 ±0,93	<0,01
Tс	82,3 + 2,31	68,5 ±3,27	<0.01	87,2±2,67	96,2 ±3,08	<0,05
A°	11,1 ±0,40	8,7±0,60	<0.01	11,6 ±0,44	13,1 ±0,73	<0,05
W°с	37,8+0,65	34,5 ±0,80	<0,01	38,8 ±0,62	41,4 ±0,92	<0,05
Γц	2,0 ±0,09	1,8±0,12	>0,05	2,1 ±0,08	2,2±0,12	>0,05

Notations: LP-year period; Tс - total time; A° - amplitude; W°с - criminal velocity of the slow component; Hz-frequency; in the column "ipsilateral labyrinth" - results of calorization of the labyrinth towards which the spontaneous nystagmus is directed; in the column "contralateral labyrinth" - results of calorization of the opposite labyrinth; X - arithmetic mean; +m - mean error; p - significance level.

Table 1 shows the standard indices of caloric nystagmus in patients of subgroup I A and in the control group during the cold test. Even without taking into account the spontaneous component, there is a significant difference between the indices in the control group and in the patients, as well as between the calorization data of the ipsi- and contralateral labyrinths. These differences are caused by the fact that in patients in the stage of spontaneous nystagmus of the first degree, the ipsilateral labyrinth responds with less energetic caloric nystagmus to the cold stimulus than the contralateral one. Probably, at this stage, the character of the caloric response is determined mainly by the state of the analyzer periphery, and we do not observe any paradoxical changes in the adequate response of the vestibular apparatus, of course, taking into account the "addition" to the caloric component, which is represented by the spontaneous nystagmus of the first degree.

In patients of subgroup 1B, the results were less unambiguous, as this subgroup included individuals with different time periods from the onset of labyrinthine disorders. In this regard, three groups were formed from subgroup 1B: "a" - 15 persons admitted in the first 1-3 days from the onset of the attack, spontaneous nystagmus (SN) of II degree towards the "sick"

labyrinth1; "b" - 6 persons admitted for examination and treatment on the 4-7th day from the onset of the attack, SN of II degree towards the "sick" labyrinth; "c" - 11 patients who had 8-10 days from the onset of the attack, SN of II degree towards the "healthy" labyrinth.

Table 2 shows the parameters of amplitude and angular velocity of the slow component of caloric nystagmus during cold and heat calorization of the ipsilateral (ILL) and contralateral (CLL) labyrinths.

During cold calorization of ILL (group "a"), an increase in vestibular excitability was detected for all indicators of caloric nystagmus. The same test reveals a decrease in CLL excitability. In patients of group 1 A ILL ("sick"), being in the stage of increased excitation, reacts to cold ("contrast") stimulus by the type of "recruitment", while the reaction of CLL ("healthy") indicates reciprocal inhibition of the latter.

In group "b", probably, there is a further stage of the pathological process development, as evidenced by the data of clinical examination and analysis of the results of the study of caloric nystagmus.

Type of calorization	Groups subjects	Amplitude and angular velocity indices of the slow component of caloric nystagmus							
		Ipsilateral calorization				Contralateral calorization			
		A°		W o/c		A°		W o/c	
		X±m	t _p	X±m	t _p	X±m	t _p	X±m	t _p
Cold	"a"	19.8±0.67	8.2	44.8±0.98	4.2	8.3 0±.60	4.5	12.1± 1.2	15.2
	"б"	4.8±1.2	5.0	8.8 ±0.54	35.9	2.2 ±0.88	9.1	3.4 ±0.72	35.4
	"B"	12.1±0.74	0.7	37.6 ±0.88	1.1	1.6± 0.9	9.7	2.2± 0.88	32.3
Thermal	"a"	4.1 ±0.53	10.5	7.1 ±0.70	32.3	9.8± 0.41	2.3	16.5± 0.71	22.2
	"б"	12.0 ±0.82	11.6	1.6 ±0.82	37.0	2.8± 1.32	6.5	4.8 ±0.86	33.0
	"B"	11.6 ±0.78	0.8	34.2± 1.3	4.0	1.6± 0.96	9.8	2.4± 0.96	35.0

At this stage there is a pronounced suppression of the function of both labyrinths: their response to both cold and heat stimuli almost completely disappears, but their own spontaneous reactions are sharply expressed (SN - III degree), probably blocking the mechanisms of receptivity of external stimuli. At the end of this stage, the process of fading of reactivity of the "sick" labyrinth begins, as a result of which the contralateral ("healthy") labyrinth is freed from its reciprocal influence, taking on the role of forming spontaneous and evoked reactions. This is manifested primarily in a change in the direction of the SN, which after the 7th day from the onset of the attack begins to "beat" toward the "healthy" labyrinth '.

At this stage, the "healthy" labyrinth responds to cold and heat calorization with a near-normal reaction (see group "c", ipsilateral calorization), while the "sick" labyrinth practically does not respond to stimuli (see group "c", contralateral calorization).

The above dynamics of the functional state of the labyrinths was reflected in the evolution of the amplitude of the slow component of the caloric vestibular nystagmus, which we subjected to graphic analysis (Figs. 1 and 2). The whole period of examination was divided into 4 stages, the periodicity of which corresponded to the temporal criterion of the formation of groups "a", "b" and "c", i.e., certain stages of development. The total curves of the dynamics of the amplitude of the isolated caloric nystagmus showed that the reaction of the "healthy" labyrinth to cold and heat stimuli is the same: by the 4th-5th day from the beginning of the attack its excitability decreases, then by the 8th-9th day it sharply increases and then remains at a level approaching the norm. Calorization of the "sick" labyrinth has the following principal features: a cold stimulus in the first 3 days reveals a significant increase in its excitability ("recruitment") to this ("contrast") stimulus, whereas this labyrinth responds to a heat stimulus with a weakened reaction. In this stage we observe spontaneous nystagmus of the II degree in the direction of the "sick" labyrinth and pronounced asymmetry of excitability of both vestibular apparatuses.

In stages II and partially in stages III, i.e., on days 5-9, the level of the curve of the "sick" labyrinth sharply decreases, indicating the fading of its function, and the level of the curve of the "healthy" labyrinth increases during the same period, probably as a result of the fact that the "healthy" labyrinth is freed from the reciprocal influence of the pathological labyrinth due to its temporary shutdown.

By this time, the spontaneous nystagmus maximally expressed in stage II changes its direction toward the "sick" labyrinth and in stage III is directed toward the "healthy" labyrinth. In stage IV (I -14th day), convergence of the curves of the "healthy" and "sick" maze is observed, which indicates normalization of the excitability of the vestibular analyzer.

Thus, the analysis of the dynamics of the amplitude of the slow component of the caloric vestibular nystagmus confirmed our assumption about the existence of phasicity in the pathogenesis of the development of an attack of labyrinthopathy of vertebrobasilar genesis. The mentioned phase determines the stages of the pathologic process and depends on the temporal mutual influence of the labyrinths. The deepest disturbance of vestibular function in the patients under our observation fell on the period

between the 3rd and 10th day from the onset of the attack and was characterized by variegated and pronounced clinical manifestations, lack of a persistent therapeutic effect of the applied medications, sometimes even perverted reaction to them in the form of intensification of certain symptoms (dizziness, nausea, etc.). During this period there is a kind of autonomization of the pathological process, during which the vestibular apparatus functions as a closed system, inaccessible to external stimuli.

Results: The results of the study indicate that the vestibular attack, probably of any functional genesis, is based on regular processes of reciprocal influence of the labyrinths mediated through the central structures of the vestibular system proper and other conjugated systems (cerebellum, hypothalamus, etc.).

This situation gives grounds to hope for success in the search for pathogenetic treatment of patients suffering from vestibulopathy, based on the development of methods of specific neuropharmacological effects on the central "stations" of efferent regulation of trophic and labyrinth functions.

Conclusions: 174 patients suffering from cervical osteochondrosis with a vertebral artery syndrome were examined to assess dynamics of vestibular analyzer functional state in various periods of the disease using bithermal caloric test and electronystagmography.

The authors determined the regularities of caloric and spontaneous nystagmus interaction in these patients; a special method they have used gave the possibility to construct for the first time the curves of reciprocal interactions of labyrinth excitability that reflected phase regularities in development of a vestibulopathy attack of the given genesis. It is suggested that in management of these attacks phase state of the vestibular system should be considered.

LIST OF REFERENCES:

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.
2. Adxamovich X. A. et al. The Diagnosis and Treatment of Paranasal Sinus Cysts //Genius Repository. – 2023. – T. 26. – C. 23-29

3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. 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.
9. 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.
10. 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.
11. 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. – T. 2. – №. 12. – C. 29-36.
12. Xatamov J. A. et al. Comprehensive diagnosis and treatment of chronic purulent otitis media with complications //World Bulletin of Public Health. – 2023. – T. 28. – C. 73-75
13. Xatamov J. A. et al. Comprehensive diagnosis and treatment of chronic purulent otitis media with complications //World Bulletin of Public Health. – 2023. – T. 28. – C. 73-75.