INTERACTIONS BETWEEN COCHLEOVESTIBULAR DISORDERS AND ARTERIAL HYPERTENSION IN PATIENTS

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Abstract. The article presents the otoneurological characteristics of pre-stroke cerebrovascular disorders in patients with essential hypertension. Among the problems of modern otorhinolaryngology, one of the leading places belongs to cochleovestibular disorders in some cardiovascular diseases, in particular, hypertension. The state of vestibular function in arterial hypertension was studied by many authors who noted a decrease in resistance in such patients. It has been established that one of the reasons for the formation of secondary cochleovestibular disorders is chronic hypertensive encephalopathy, which develops in patients with arterial hypertension, often already in the early stages of the disease. In the study of the peculiarities of the pathogenesis of cochleovestibular disorders, certain results have made it possible to study the nature of the vestibulo-vascular interaction. It is shown, in particular, the difference in vestibulo-vascular reactions in the case of central and peripheral lesions of the vestibular analyzer, which is important for the differential diagnosis of these pathological conditions.

Keywords: hearing, arterial hypertension, cochleovestibular disorders.

Introduction. The cochleovestibular apparatus is one of the most ancient analyzers; it is the first of all receptors to form in embryogenesis [4-15]. According to its structure, extensive connections within the CNS and functional properties, the cochleovestibular apparatus differs sharply from all cranial nerves: when it is stimulated, not a narrow local reaction occurs, but an effect on all body functions (somatic and autonomic) is observed [3].

The central parts of the vestibular and auditory analyzer are very complex, which reflects the diversity and complexity of the function of this peculiar nerve [1-6]. Morphologically and functionally, the vestibular apparatus is clearly divided into two sections: the otolith apparatus and the system of semicircular canals. The first responds to rectilinear accelerations and deviations from the vertical, while the second to angular accelerations in any of the three main planes in which the channels are oriented [17-34].

The vestibular nerve enters the brainstem at the level of the cerebellopontine angle, slightly above the external (cochlear) root, between it and the spinal root of the Y nerve. In the internal parts of the rope body, not reaching the bottom of the IV

ventricle, the vestibular nerve divides into ascending and descending branches. Part of the descending fibers terminate in the lower nucleus, part in the medial and lateral nuclei [14-26]. The ascending fibers of the vestibular nerve terminate in the superior nucleus. Some of these fibers, passing through the nucleus, end in the roofing nucleus of the cerebellum [42].

The vestibular nuclear complex is located at the level of the upper part of the medulla oblongata and stretches in the retrocaudal direction by 9.5-12 mm. The works of the above authors have shown that the nuclei of the vestibular complex are very complex in structure [23-47]. The cytoarchitectonics of each of them has features, as well as extensive afferent-efferent connections with various formations of the central nervous system, and from the latter to the vestibular nuclei. A distinctive feature of the nuclear vestibular complex is an unusually large number of pathways emerging from it in a wide variety of directions and connecting the nuclei with various anatomical structures of the brain. These connections provide a diffuse effect of the vestibular apparatus on all functions without exception [48-51]. The most important clinically are the following connections of the vestibular nuclei: connections with the spinal cord; with eye muscles; vestibulo-vegetative connections; vestibulocerebellar connections; connections with the reticular formation of the brain stem; with the cerebral cortex [52-57].

Hypertension is a widespread disease that affects people of working age, and is also the most common cause of disability and death from cardiovascular diseases [39]. The fight against this disease, early detection of signs of damage to target organs is an urgent problem of modern medicine [5,31-42].

According to the literature, hemodynamic, humoral, reflex and other disorders that occur in hypertension can lead to the development of various cerebrovascular disorders, up to strokes [58-66]. So Feigin V.L. reports that according to the International Congress on Stroke, arterial hypertension can cause stroke in 75% of cases. According to Khodzhaev A.A. pre-stroke cerebrovascular disorders (DCVR) in hypertensive patients are detected in 83% of cases. At the same time, according to many researchers, Majidov N.M., Troshin V.D., Kistnev B.L. et al. the diagnosis of CVD, especially its initial forms, as well as their differential diagnosis from brain lesions of other etiologies presents certain difficulties. In this regard, otoneurological studies can play an important role. In particular, the connections of the vestibular analyzer within the CNS with most functional systems, the objectivity and sensitivity of vestibular reflexes make vestibular symptoms invaluable in determining the level of brain damage, assessing the dynamics of the process, and the degree of compensation of stem and hypertensive processes [67].

It should be noted that the existing literature reflecting cochleovestibular disorders in HD patients is presented mainly on the basis of prescription, HD stage, but

without taking into account cerebrovascular disorders [39,40]. In separate reports on LCVR in HD, cochleovestibular disorders are only listed among the pathologies of other cranial nerves [11,56]. We did not find in-depth otoneurological studies in HD patients with CVD, especially with a reflection of their dynamics against the background of the use of modern antihypertensive drugs. It is also impossible to consider the issue of the frequency of occurrence and nature of auditory and vestibular disorders as resolved, so if Tanchev K.S. (1999), believes that in hypertension, hearing loss is mild and rare, then according to Agakhanova A.G. and Lebedeva N.V. (2003) such a pathology is detected in more than 90% of cases.

The aim of work is to study the otoneurological characteristics of pre-stroke cerebrovascular disorders in patients with hypertension.

Material and methods. Under our supervision were 110 patients with GB of a stable course treated in the clinical bases of the Research Institute of Cardiology of the Ministry of Health of the Republic of Uzbekistan. GB was diagnosed according to WHO criteria (1978). The control group consisted of 30 persons not suffering from GB.

All examined were males, whose age was distributed as follows. 25-44 years old - 12 people (10.9%), 45 - 59 years old - 76 patients (69.1%) and over 60 years old - 22 examined (20%).

As can be seen from the above data, among the patients with GB examined by us, persons aged 45-59 years predominate, i.e. mature and older persons.

The duration of GB varied from 1 year to 20 years, including; 1 year suffered from hypertension 1 person, 1 - 5 years - 30 patients, 5-10 years - 36 examined, 10-15 years - 30 people and more than 15 years were 13 people.

Regarding the research methods, it should be noted that all patients underwent a general clinical examination, which included: examination of the somatic (cardiological), neurological and otoneurological status, rheoencephalography (REG), echoencephaloscopy (EchoES), electroencephalography (EEG), audiometry (AM) and electronystagmography (ENG) according to generally accepted methods.

In addition, all patients underwent a general analysis of urine, blood, the level of total cholesterol, lipid fractions in the blood, and a coagulogram were determined. Since the obtained results of biochemical studies did not differ from the literature data, we did not describe them.

Excluded from the study were persons who had previously suffered from ENT - diseases that could cause hearing loss, regardless of hypertension.

Results and discussion.

Initial state of cochleovestibular function in patients with GB with CVD and in the control group.

Functional examination of the organ of hearing and vestibular apparatus was preceded by an examination of the upper respiratory tract and ear, the results of which are shown in Table 1.

Table 1

The state of the upper respiratory tract in patients with GB with DCVR.

Changes	Number of patients	% of the total
Deviated septum	26	23,6
Vasomotor rhinitis	3	2,7
Nasal bleeding	15	13,6
The development of the vascular pattern	25	22,7
a) nasal septum	14	12,7
b) oropharynx		
mucosal atrophy:	6	5,4
a) nose	9	8,1
b) throats	13	11,8
chronic tonsillitis	11	10
chronic pharyngitis		

The table shows that in hypertension with LCVR, the most common deviated septum and the development of the vascular pattern on the mucous membrane of the nose and pharynx. These changes were usually localized in symmetrical areas of the nasal septum and soft palate, and were not accompanied by any unpleasant subjective sensations..

Of the 110 patients with DCVR examined by us, 76 people (69.1%) complained of noises: of these, noise was localized in the ears in 15 patients (13.6%), in the head - 12 people (10.9%), in the head and ears 49 patients (44.6%).

Frequency and localization of noises by DVR forms.

TsVR form	in the ears	in my head	in the head and ears	Total	% to total Quantity
NPNMK	2	2	8	12	10,9
GE-I dg.	4	4	16	24	21,8
GE-II dg.	5	3	14	22	20
	4	3	11	18	16,4

HPP PNMK					
Total	15	12	49	76	69,1

Of the above 76 patients with GB with LCVR, 25 people noted constant noises, 51 - periodic. Most patients noted a relationship between the occurrence and intensity of noise with a deterioration in general well-being, increased blood pressure and increased headaches. These noises were usually subjective in nature and were expressed in a very diverse way: patients noted whistling, ringing, buzzing, murmuring water, slight wind noise, etc. The nature of the subjective noise was different: low and high pitch, constant, periodic, one-sided and two-sided.

According to the data, out of 28 people suffering from NPLMC, 12 (42.8%) complained of noise in the head and ears; hypertensive encephalopathy (HE)-I stage out of 37 people 24 (64.8%) complained of noise in the head, ears: hypertensive encephalopathy stage II - 22 (84.6%) of 26 patients and out of 19 patients with HE and PNMK - 18 (94.7%). Therefore, the frequency of noise complaints increases as the disease worsens. We also analyzed the relationship between noise complaints and hearing loss.

In order to clarify the nature of tinnitus and head noise, we compared these data with those of the control group. In the control group, noise was detected in 2 people out of 30 examined, which is 6.6%. Thus, in patients with hypertension, the noise was more common by 62.5% than in the control group, and, therefore, is a sign of damage to the organ of hearing in DTsVR on the basis of GB.

Of the 110 examined, 50 (45.5%) complained of hearing loss, and of these, only 6 people complained of unilateral hearing loss, the rest - bilateral. Most of those who complained of hearing loss noted that they hear the words, but they do not always understand their meaning..

The results of the study of hearing acuity speech.

Of the 110 examined, deterioration in the perception of whispered speech was found in 85 (77.3%) patients, and only in 6 it was unilateral, and in the rest it was bilateral. In the majority of the surveyed, the hearing for whispered speech is reduced from 3 to 6 meters. Information about the hearing acuity for whispered speech in the examined is presented in the table 2.

Table 2

Characteristics of hearing acuity for whispered speech in patients with GB with LCVR

Form DTSVR	Within Norms	Raising the threshold in abs. figures		
				Bcero

		up to 3 m.	from 3 to 6 m	Quantity	% to total qty
NPNMK	10	1	17	18	16,4
GE-I dg.	11	3	23	26	23,6
GE-II dg.	4	5	17	22	20
HPP PNMK	-	7	12	19	17,3
Total:	25	16	69	85	77,3

In the control group, normal perception of whispered speech was found in 28 people (93.3%), in two examined patients, a decrease in hearing for whispered speech up to 5 m on both sides was noted, which may be associated with age-related changes. Thus, the normal perception of whispered speech in the control group occurred more than 10 times more often than in patients with LCVR (table 3).

Table 3

Characteristics of hearing acuity for colloquial speech in HD patients with CVD

Form LCVR	Within norms	Perception of spoken language in meters			
		up to 3 m.	3 - 6 m	6 - 9 m	Total
NPNMK	14	-	2	12	14
GE-I dg.	17	1	3	16	20
GE-II dg.	6	3	6	11	20
HPP PNMK	2	5	8	4	17
Total:	39	9	19	43	71

According to the data in the table, the perception of colloquial speech is not impaired in 39 (35.5%) of the examined, in 71 (64.5%) - the perception of colloquial speech is reduced; with NPNMK - in 14 of 28 patients, GE - I st. in 20 out of 37, with GE - II st. - in 20 out of 26, and in HE with PNMK in 17 out of 19 examined.

In the control group, normal perception of colloquial speech was found in 29 people (97.3%) out of 30 examined, in 1 examined there was a decrease in hearing on the right side of colloquial speech up to 7.5 m.

Thus, the perception of whispered speech was impaired in 85 (77.3%), and conversational - in 71 (64.5%). Therefore, in patients with LCVR, the perception of whispered speech suffers more than conversational speech..

Conclusion. Thus, disturbances in the sound analyzer in GB are characterized by: deterioration in perception, mainly of high frequencies, especially during bone conduction, hearing damage of both labyrinthine and retrolabyrinthine nature, dissociation between the perception of speech and pure tones. In most patients with hypertension, various stato-kinetic disturbances are detected, both of a spontaneous

nature and with the use of experimental samples. Spontaneous nystagmus in such patients is rare (4.5%) and has features of central origin (combined with dizziness of the central type, bilateral, classic, horizontal). When using experimental samples, nystagmus increases. Tonic reactions proceed normally. When using the sensitized Romberg test, tonic disorders are detected in most of these patients. Observation of the dynamics of vestibular reactions in such patients makes it possible to reveal the interest of the stato-kinetic apparatus where there are no spontaneous disorders yet. So, on the electronystagmography of the caloric reaction, the majority of the examined patients revealed altered responses (75.5%), namely: asymmetry (30%), hyporeflexia (28.2%), hyperreflexia (11.8%), areflexia (5.5%).

Most patients with GB are characterized by hyporeflexia and asymmetric responses. With an inhibitory type of reaction, they can manifest themselves as a disharmonious deviation of the hands, sometimes with the transition of inhibitory reactions to hyperreflexia and a normal reaction, dissociation between the degree of nystagmus and autonomic motor reactions. All this points to the defeat of the central departments of the VA. The asymmetry of vestibular reflexes can be along the labyrinth, between the individual characteristics of nystagmus and the severity of vestibulo-vegetative and vestibulo-motor reactions. Thus, in patients with calorization, altered responses are noted, indicating the presence of central vestibular disorders. They can be used for diagnostic purposes.

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