

Treatment of Elderly People with Sensorineural Hearing Loss

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Abstract: Age-related changes in auditory function in atherosclerosis are based on morphological changes in the inner ear. The problem of pathology of the inner ear, which occurs against the background of vascular atherosclerosis, has not been sufficiently studied, and therefore it is advisable to conduct further study of the state of cerebral circulation for the diagnosis and treatment of elderly patients. To achieve this goal, we examined 60 people aged 55 to 70 years. Taking into account the data on the state of auditory function, REG, ECG and other studies, patients suffering from sensorineural hearing loss on the background of atherosclerosis and osteochondrosis of the cervical spine were treated. In the presence of osteochondrosis of the cervical spine, patients were recommended physical therapy, massage of the cervical-thoracic spine up to 10-20 sessions (taking into account blood pressure), complamin, calcium pangamate, cerebro-lysine, relanium. After the therapy, all patients showed an improvement in the perception of whispered and spoken speech.

Key words: Sensoneural hearing loss, atherosclerosis, complamin.

Age-related changes in auditory function in atherosclerosis are based on morphological changes in the inner ear, in particular, in the spiral organ and vascular strip, morphological studies have found that age-related changes occur in the vascular system of the cochlea. They concern the caliber of arterioles and venules, the reduction of their number, the disappearance of part of arteriovenular anastomoses. (1,3,5) With atherosclerosis of the vessels, the main whorl of the cochlea is selectively affected (degenerative process). However, in general, the problem of pathology of the inner ear, occurring against the background of vascular atherosclerosis, has not been studied enough. In this regard, it is advisable to conduct further study of the state of cerebral circulation for the diagnosis and treatment of elderly patients suffering from sensorineural hearing loss.

To achieve this goal, we examined 60 people aged 55 to 70 years, among them there were 32 women, 24 men aged 55 to 60 years and 36 from 60 to 70 years. In 16 persons, hearing loss began 10 years ago, and in 44 - over 10 years. All patients were consulted by a therapist and a neurologist. In the study of blood (general analysis and sugar) and urine, no pathological abnormalities were detected. X-ray examination revealed the phenomena of osteochondrosis of the spine in the IV-VI cervical vertebrae in all patients. 12 people had a periodic increase in blood pressure, persons with hypertension were not included in the development. The most frequent complaints among the examined patients were hearing loss and tinnitus, which is permanent in 37 patients. Pathological intentions on the part of other ENT organs were not revealed.

Hearing was examined before and after treatment: the perception of whispered and spoken speech was determined, threshold and supra-threshold, tonal speech audiometry was performed. they perceived whispered speech at a distance of up to 1 m 15 people, from 1 to 3 m - 16, more than 3 m 8, did not hear it - 21. Colloquial speech at the auricle was heard by 6 patients, at a distance of 0.1 to 1 m - 14, from 1 to 3 m - 10, from 3 to 5 m - 17 and over 5 m - 13.

The degree of hearing loss by air conduction in two frequency ranges (speech and upper) is presented in Table 1.

Table 1. Perception of tones by air and bone conduction in elderly patients with sensorineural hearing loss before treatment.

Studied indicators	Thresholds of auditory perception in patients before treatment							
	Up to 30 dB		31-50 dB		51-70 dB		Over 70 dB	
	125-3000 Hz	4000-8000 Hz	125-3000 Hz	4000-8000 Hz	125-3000 Hz	4000-8000 Hz	125-3000 Hz	4000-8000 Hz
Air conductivity	19	11	14	14	13	16	14	19
Bone conductivity	18	9	13	16	14	18	15	17

Table 1 shows that hearing loss of more than 50 dB at frequencies 125 - 3000 Hz was in 27 persons in the range 4000 -8000 Hz – in 33.

The state of cerebral circulation was judged according to rheoencephalography, rheoencephalograms were recorded using a six-channel electrocardiograph 6-NEK (GDR) and a rheographic prefix -RG-1M according to the generally accepted method but front-mastoidal (F-M) and occipito-mastoidal (O-M) abductions characterizing the state of the internal carotid basins and vertebral arteries. When evaluating rheoencephalograms, attention was paid to the shape of the REG curves: the nature of its rise and descent, the peaks, the severity and location of the incision and the presence of additional ones on the cataclysm. When quantifying, the amplitude (a) of the main wave in ohms was taken into account, as well as the ratio of the amplitude from the incisure level to the amplitude of the main wave (dci), expressed as a percentage, the atherogenic coefficient (ac), which is the blood filling values of the symmetrical sides of the head, also expressed as a percentage; the pulse wave propagation time in seconds.

During visual evaluation, typical signs for REG curves in atherosclerosis were determined, it was characterized by an obtuse angle of elevation of the anacrotum, the presence of a round and humpback apex, a convex cataclysm with a weakly represented incisor located on the upper third of the cataclysm with a poorly expressed diastolic wave and the absence of additional waves on the cataclysm. with the introduction of vasodilators, the slowness of the reaction that occurred earlier, after taking the drug, was noted. the results of studies of cerebral circulation indicate significant deviations from those of the control group. In all examined patients, a decrease in the amplitude of the REG in the basin of the internal carotid and vertebral arteries of the right (0.095 ± 0.010 and 0.059 ± 0.010 10 s) of the left (0.088 ± 0.0009 and 0.044 ± 0.005 s) hemispheres, an increase in the time of ascent of anacrotum, more pronounced in both studied basins of the left hemisphere, an increase in the DCI and pulse wave propagation time in the basins of the internal carotid and vertebral arteries, the presence of an asymmetry coefficient equal to 20.68 ± 1.82 in the basin of the internal carotid artery and $34.09 \pm 2.14\%$ in the vertebral artery was characteristic for this group of patients.

Taking into account the data on the state of auditory function, REG, ECG and other studies, patients suffering from sensorineural hearing loss against the background of atherosclerosis and osteochondrosis of the cervical spine were treated.

Due to the fact that the etiology and pathogenesis of atherosclerosis are complex, the arsenal of drugs that effectively affect it is currently insufficient. In this disease, hypolipid drugs (nicotinic acid, nicotinamide, complamin, theonicol) are prescribed, which prevent the formation of lipoproteins, nicotinic acid in the observed individuals was used in the quantity of 1 tablet 3 times a day after meals for 3 weeks. Complamin was administered intramuscularly up to 10 -15 injections also after meals, starting from 0.7 ml, gradually increasing to 1.5 ml. These drugs have not only hypo-lipid properties, but also enhance the effect of antihypertensive agents, expanding small vessels of the brain, improving blood flow in them, increasing the resistance of the brain to hypoxia.

Along with nicotine-type drugs, unsaturated fatty acid preparations have been used to increase the utilization of saturated fatty acids, in particular linetol. It, in addition to the lipid effect, has the property of reducing blood clotting and activating fibrinolysis. This drug was prescribed 1.5

tablespoons on an empty stomach in the morning for 1.5 months, after which they took a break from taking it for 2-4 weeks with the repetition of 2-3 courses.

To stimulate the formation of phospholipids in the liver and prevent its fatty infiltration, 1 tablet was given 3 times a day for 2 months. In combination with the prescribed medications, it was also recommended to take 1 tablet of calcium pangamate 3 times a day for 45 days (2 courses), vitamin C, pyroxine, which have a certain lipid effect. Along with these drugs, intencordin, curantil, dipromonium were prescribed to improve cerebral and central circulation.

To normalize metabolic processes in brain tissue (especially in the presence of atherosclerotic encephalopathy with memory impairment), cerebrolysin was administered intramuscularly 1 ampoule every other day. To improve the utilization of carbohydrates, cocarboxylase was prescribed up to 20 injections (200 mg each) intramuscularly daily for 15-20 days, taking into account that it regulates metabolic processes in the cochlea and venous outflow, reduces vascular tone, increases oxygen saturation of the perilymph to stabilize energy processes, conduct nerve impulses

Intramuscularly disodium salt of adenosine triphosphate acid (ATP) 1 ml to 20 injections. Patients who had an increase in blood pressure, combined with an increase in the tone of the cerebral vessels against the background of an increase in peripheral vascular resistance and venous stagnation (according to REG), were prescribed vincapan 1 tablet 3 times a day for 1 month, a decoction of valerian (12.0 per 200.0 water) 3 times a day, to relieve muscle tension, have a calming effect on the central nervous system, reduce the excitability of the limbic system of the thalamus and hypothalamus - relanium, 1 ampoule intramuscularly at night for up to 10 injections, followed by continued administration of 1 tablet at night for 1 month.

Table 2. Perception of tones by air and bone conduction in elderly patients with sensorineural hearing loss after treatment.

Studied indicators	Thresholds of auditory perception in patients after treatment							
	Up to 30 dB		31-50 dB		51-70 dB		Over 70 dB	
	125-3000 Hz	4000-8000 Hz	125-3000 Hz	4000-8000 Hz	125-3000 Hz	4000-8000 Hz	125-3000 Hz	4000-8000 Hz
Air conductivity	23	11	16	18	11	20	10	11
Bone conductivity	24	11	15	18	14	21	7	10

In the presence of osteochondrosis of the cervical spine, patients were recommended exercise therapy, massage of the cervical-thoracic spine up to 10-20 sessions (taking into account blood pressure). Persons with a tendency to high blood pressure and hypertensive type of REG curves, along with antispasmodics, were prescribed massage along the spine, and at the end of it - darsonval currents along the cervical-thoracic spine up to 12 sessions. Dibazole, which reduces diastolic pressure and improves venous outflow of cerebral vessels and reduces venous and intracranial pressure, was administered to patients who had difficulty in venous outflow or venous stagnation in the vessels of the brain. After the therapy, all patients showed an improvement in the perception of whispered and spoken speech. So, if none of them heard whispered speech at a distance of more than 5 m before treatment, then after it 5 people perceived whispered speech at a distance of more than 5 m, and conversational speech over 5 m - 25 (before treatment - 13). A number of individuals had improved hearing in terms of air and bone conduction (Table 2). So, if a small degree of hearing loss in the speech zone (125-3000 Hz) was detected in 19 people before treatment, then after treatment in 23. The number of patients with hearing loss of more than 70 dB has also decreased (before treatment - 14, after treatment - 10). A similar dynamics was revealed after treatment and by bone conduction, in 40% of patients 100% intelligibility of the verbal test according to the Zinder-Greenberg tables was not achieved before treatment, and after it in 20 persons from this group intelligibility was restored. Comparison of the results of REG before and after therapy showed a significant improvement in blood filling, a decrease in DCI in the internal carotid artery basin, and a decrease in AC.

Thus, the analysis of REG data allowed us to establish that in patients with sensorineural hearing loss occurring against the background of atherosclerosis and osteochondrosis of the spine, after complex treatment, there is a decrease in the tone of small and medium-sized vessels in the internal carotid artery basin, a decrease in AC and an improvement in blood filling in both pools, however, not all of the detected changes in REG indicators were dynamic..

For example, the time of anacrotic rise and the pulse wave propagation rate did not differ from the initial data, the pathogenetic treatment of patients with sensorineural hearing loss indicates that the improvement of auditory function occurs in parallel with the stabilization of cerebral circulation. The criteria for the effectiveness of the treatment of elderly people suffering from atherosclerosis and spinal osteochondrosis are such REG indicators as the amplitude of the DCI, characterizing the blood filling of the cerebral vessels and the tone of the vessels of medium small caliber. The absence of dynamics of such indicators as the time of anacrotic rise and the time of pulse wave propagation indicates the need for additional outpatient treatment of such patients by a therapist and neurologist together with an otolaryngologist under the control of REG indicators and audiometry.

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