

# HYPOTENSIVE THERAPY: DYNAMICS OF HEARING IN PATIENTS WITH ARTERIAL HYPERTENSION

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## Abstract

Hypertension (AH) was designated by Russian scientists as the greatest non-infectious pandemic in the history of mankind [7-14]. This definition, given at the end of the 20th century, retains its significance at the beginning of the 21st century, when an increase in the upward trend in the incidence of GB was noted. Currently, in the fight against hypertension, it is important not only to reduce blood pressure, but also to prevent and treat organ complications [3,5]. As is known, among organ complications, cerebrovascular ones are life-threatening. In particular, damage to the auditory analyzer significantly reduces the quality of life of patients with GB. Therefore, it is very important to study the state of auditory function in patients with hypertension, to determine the relationship of this pathology in general with dyscirculatory disorders of the brain. This issue has not been covered enough in the literature, only a few reports [1-6] discuss certain aspects of this problem.

## Introduction

Considering the foregoing, the aim of this work was to study the state of auditory function in patients with hypertension with pre-stroke cerebrovascular disorders (DCVR) and their dynamics during treatment with modern antihypertensive drugs.

## Material and research methods

We examined 79 patients with GB, who had a duration of the disease from 1 to 15 years. Among the sick men were 92, women - 18, their age ranged from 31 to 73 years. According to the structure of the identified LCVR, the patients were distributed as follows: with initial manifestations of inferiority of the brain blood supply (NPNKM) 20 patients, with hypertensive encephalopathy (HE)-Ist. - 20 people, with GE-II Art. - 20 and HE with episodes of transient cerebrovascular accident (TIMC) - 19 patients.

The examination included: examination of the somatic (cardiological), neurological and otoneurological status, rheoencephalography (REG), echoencephalography (EchoES), electroencephalography (EEG), audiometry (AM) and electronystagmography (ENG) according



to generally accepted standard methods. The specified set of examinations was carried out by the patient twice, before and 1 month after treatment. In 40 patients, antihypertensive therapy was carried out with the ACE inhibitor Vasotec (enalopril) at a dose of 5-10 mg/day. 39 patients received antihypertensive therapy with calcium antagonists (corinfar up to 30 mg/day or norvascom 5-10 mg/day). No statistically significant differences were found in terms of the effect on the indicators of auditory function, and therefore the results are summarized.

### Results and discussion

Analysis of patients' complaints showed that out of 79 patients who complained of tinnitus, 28 had completely regressed, and 51 had partially. When comparing the dynamics of noise with the dynamics of blood pressure, we observed the following picture. Of the 64 patients with CVD with a decrease in blood pressure as a result of treatment, murmurs disappeared or decreased in 42, respectively (65.6%). And among those with unchanged blood pressure, murmurs remained unchanged in 63.3% of cases. The dynamics of tinnitus in the context of the LCVR structure looked as follows: in patients with NPNKM, the noise decreased or disappeared in 17 out of 20 (85%), in patients with HE-I stage. - in 13 out of 20 (65%), GE-IIst. - in 10 out of 20 (50%), and in patients with HE with MIMC, the murmurs disappeared or decreased only in 5 out of 19 (26.3%). According to the study of hearing acuity by speech, after treatment, a significant improvement in hearing occurs in the initial stages of the disease, while in later stages, improvement occurs in a smaller percentage of cases. It should also be noted that the perception of colloquial speech improves to a greater extent than whispered.

The results of tuning fork C128 studies of sound perception through the air in patients who received calcium antagonists showed that positive dynamics occurs in 48.7%, and in patients who received ACE inhibitors in 50%. As can be seen, the differences are not statistically significant. At the same time, the difference in bone conduction is more distinct, amounting to a positive trend in the group with AK 41.01% and in the ACE inhibitor group 45.0%.

Audiometric studies of auditory function have expanded the understanding of the state of hearing in patients with hypertension with CVD, both in terms of initial and dynamic data. In particular, audiometric indicators of hearing loss according to the initial data were detected in 65 (81.2%) patients out of 79. After a month of antihypertensive therapy, positive audiometric dynamics was detected in 36 (55.3%) of 65 patients. The structure and dynamics of audiometric changes were as follows: a) in the majority of patients with an isolated lesion in the perception of high-pitched sounds during treatment, some improvement in the perception of these sounds was observed within 10-15 dB, less often 20 dB. b) in some patients with a general increase in the thresholds of auditory sensitivity, a decrease in hearing thresholds was observed over the entire frequency range within 10-15 dB, less often -20 dB. c) in several patients with GE-II and HE with PNMK, a mixed change in hearing was observed, which consisted mainly in improving the perception of low sounds and worsening the perception of high sounds within 10-15 dB, less often 20 dB.

Interesting data were obtained in the analysis of the dynamics of blood pressure and audiological changes. Of the 79 patients, BP was reduced to target values in 64 (81%) cases. At the same time, audiometric parameters normalized in (18.4%) patients, improved in (15.3%) patients and remained unchanged in (3.1%) patients ( $P < 0.05$ ). There were no cases of hearing loss. BP did not



reach the target values in 15 (19%) patients. There were no cases of hearing normalization in this subgroup. Improvement occurred in (3.1%) patients. Hearing remained unchanged in (9.2%) and worsened in (3.1%) patients.

From the comparative data, it can be seen that the percentage of positive changes with a decrease in blood pressure to target values is much higher (%) than with ineffective antihypertensive therapy (%). It was found that the latter patients were mostly diagnosed with GE-II st. and HE with PNMK, that is, these are the cases when the state of cerebral hemodynamics and dyscirculatory disorders are not sufficiently correlated with antihypertensive drugs. This thesis was also confirmed by the results of neurophysiological (REG, EchoES, EEG) studies.

It should also be noted that when comparing the degree of improvement in hearing acuity by speech with a change in hearing sensitivity thresholds as a result of treatment, it was noted that in some patients, in the absence of any shifts in hearing thresholds, there was a significant improvement in hearing acuity for whispered speech. Such data may indicate that hearing loss in hypertensive patients is caused not only by damage to the receptor of the auditory analyzer, but also to its cortical centers.

### Conclusion

Thus, it can be concluded that the study of the state of the auditory analyzer in patients with AH makes it possible to determine not only the early signs of damage to the brain, the target organ of AH, but also to assess the severity of dyscirculatory disorders.

Our studies confirm the literature data (1,3,5,8) on the high hypotensive efficacy of ACE inhibitors (Vazotek) and calcium antagonists (Corinfar, Norvasc) in patients with GB, show their ability to improve auditory disorders in NPCM and GB-I stage. To achieve the desired results in patients with EH with ET-II and HE with PNMK, it is necessary to combine antihypertensive therapy with neurometabolic and antioxidant drugs. Other researchers speak about such tactics in the treatment of dyscirculatory encephalopathy of various origins (2,4,5).

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