Characteristics of Complaints of Workers in Noise Professions with Auditory Impairments

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ABSTRACT

The authors performed the examination of 230 workers whose exposure to noisy working environment ranged from 1 to 30 years and of 30 normal-hearing persons who were not exposed to noise. Tonal threshold, suprathreshold and speech audiometry were made using the audiometer MA-31 (GDR). Rheoencephalographic and thermographic studies were also performed. The examined persons were divided into 6 groups according to the hearing function state. Decreased hearing level and tinnitus were marked in all the persons with disturbed hearing function irrespectively of the duration of service in the noisy environment. Analysis of complaints of "noisy" workers suggested that there is a relationship of these complaints to the state of the cerebral circulation and hearing function.

Keywords: nervous system, tinnitus, dizziness, headache, general weakness, noise

The high degree of mechanization and automation of industrial enterprises places increased demands on the condition of the central nervous system of people working for them, as well as sound and visual analyzers, hemodynamics in general. The introduction of new technology, equipment, tools and materials leads to the appearance of various kinds of adverse factors affecting the body of workers. At the same time, noise has the main negative effect, causing significant changes in the sound analyzer (1,3).

According to many authors, the number of people complaining of tinnitus, dizziness, headache, general weakness, a feeling of heaviness in the back of the head, and sleep disorders during the development of professional hearing loss is increasing (4,5).

Taking into account the above, we analyzed the most typical complaints of the surveyed workers (headache, dizziness, tinnitus, hearing loss, sleep disorders) in connection with audiometry, rheoencephalography and thermography data. The presence of 2 out of 5 listed symptoms, which were repeated at least once a week, was conditionally accepted as a diagnostic criterion.

230 workers of "noise" workshops aged from 21 to 56 years with work experience in noise conditions from 1 year to 30 years, as well as 30 normally hearing persons who were not exposed to it, were examined.

Threshold tonal, supra-threshold and speech audio measurements were performed on the MA-31 device (GDR) in a special sound-muffled chamber, where the noise level did not exceed 30 dB, as well as rheoencephalographic and thermographic studies.

The workers of the "noise" professions were divided into 6 groups: the 1st group consisted of 52 normally hearing people, the 2nd - 73 with initial hearing impairment (deterioration of tone perception up to 30 dB in the frequency range of 3000, 4000, 6000 and 8000 Hz), the 3rd — 27 with moderate hearing impairment functions (relatively reduced differentiation thresholds in the region of 2000 and 4000 Hz), 4th- 18 with minor auditory function disorders with a latent para—doxal drop in speech intelligibility and reduced differentiation thresholds in the region of 2000 and 4000 Hz, 5th — 32 with damage to the sound-receiving apparatus to a pronounced degree with dissociation of hearing into tones and speech in the direction of "speech is worse than tones", 6th — 28 with damage to the sound-receiving apparatus to a pronounced degree with a paradoxical drop in speech intelligibility and a low threshold of differentiation in the treble zone.

As our research has shown, the workers of the noise workshops of the 2nd group complained of hearing loss in 38.3% of cases, the 3rd and 4th groups - in 88.8%, and the 5th and 6th - in 100%, since they had changes in the cortical department of the sound analyzer according to speech audiometry and over-threshold tests.

Headache complaints were made by workers with both normal hearing and hearing disorders. It bothered 30.8% of people in group 1 with normal hearing, 94.5% - 2nd with initial hearing impairment, which is associated with the presence of persistent angiospasm in the basin of the internal carotid arteries, according to rheoencephalography, 51.8% — 3rd, 66.6%- 4th and 65.6% is 5th and 60.7% is 6th.

As a rule, in the 2nd group, workers complained of headaches throughout the working day, and not by the end of it, as was observed in persons of the other groups.

Dizziness is not a common symptom, but it was noted in all groups surveyed: in the 2nd - in 39.7%, in the 3rd — in 48.1%, in the 4th — in 50%, in the 5th — in 53.1%, in the 6th - in 53.5%. Consequently, dizziness most often bothered workers of the 5th and 6th groups, in whom, according to rheoencephalography, there was also the greatest decrease in the intensity of pulse blood filling in the vessels of the vertebral-basilar basin. According to thermography data, individuals of the same groups showed a pronounced symmetrical decrease in the intensity of infrared radiation in the occipital region. Even in people with normal hearing, dizziness was detected in 13.4% of observations.

One of the main symptoms of occupational hearing loss in the surveyed workers was tinnitus. In the 3rd group, 85.1% noted it, in the 6th - 82.1% of individuals.

Thus, tinnitus and hearing loss were present in all workers with impaired auditory function to one degree or another, regardless of the length of service in noise conditions.

The analysis of complaints of workers in noise professions shows their connection with the state of cerebral blood flow and auditory function. This suggests that workers in "noise" workshops complaining of headache, tinnitus, dizziness, a feeling of heaviness in the back of the head should study not only the state of auditory function, but also cerebral circulation using rheoencephalography and thermography.

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