

CURRENT STATE OF THE HYGIENIC PROBLEM OF VIBRATION IN WORKPLACES

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Abstract:

The scientific significance of the study lies in the comparative assessment of clinical, functional and other methods of studying miners, in establishing a cause-and-effect relationship between morbidity rates and exposure to industrial vibration. The dependence of neurological disorders and metabolic changes in the body on the effects of vibration has been established, taking into account the level of vibration. The practical significance of the work is due to the determination of the degree of biochemical changes in the nervous system when the body is exposed to vibration, as well as the development of sensitive, informative biochemical tests for the early diagnosis of vibration disease and methods of prevention and treatment. The data obtained provide justification for the use of specific means of preventing nervous system disorders in vibration disease through the use of traditional medicine methods.

Keywords: biochemical changes, traditional medicine methods, industrial vibration.

A large number of works are devoted to the hygienic assessment of working conditions of workers associated with transport, transport-technological and technological vibration.

The vibration of workplaces of modern machines and equipment is a broadband spectrum, covering the frequency range of 1-63 Hz. Vibration spectra are predominantly low-frequency in nature with a maximum energy in the octaves of 1-4 Hz and a decrease of 3-12 dB/octave at high frequencies.

A study of the spectral composition of vibration of workplaces such as BelAZ and KrAZ when working in a quarry showed that drivers are exposed to broadband low-frequency vertical vibration, exceeding standard values in the octaves of 8-16 Hz by 1.5-2 times. Vibration of workplaces on road trains with a carrying capacity of 20-27 tons exceeds the norm in octaves of 1-4 Hz in the vertical direction by 3-12 dB,



and in the horizontal transverse direction by 3-7 dB. Despite the fact that a large amount of equipment is used in road construction, only a few works have been devoted to the study of vibration of workplaces of road construction machines, the authors of which consider high general vibration parameters to be one of the main unfavorable factors.

Scientific work is devoted to a comprehensive study of working conditions in open-pit mining, in which materials on the study of vibration on quarry excavators and drilling rigs occupy a large place.

On excavators, the highest level of vibration was recorded at frequencies of 2, 4, 8 and sometimes 16 Hz, and the level of high-frequency vibration, as a rule, is within normal limits. When loading large, oversized rocks, shocks are observed at frequencies from 1 to 10 Hz with an amplitude of 2 mm. At workplaces of rotary excavators and drilling rigs, the level of vibration in the octave bands of 2, 4, 8 Hz exceeded the permissible values.

According to I.V. Bukhtiyarov (2018), A.D. Kabykenova (2019), on bulldozers the level of general vibration depends on their type, technical condition, road condition, and speed of movement. Maximum vibration levels were observed in the octaves of 1-4 Hz, exceeding the permissible values by 7-12 dB. The authors note that the vibration on these machines is mainly of a low- and medium-frequency nature (0.5-4 Hz and 8-16 Hz) in combination with shocks. In addition, a number of researchers note the presence of angular movements on excavators.

An increase in the power and dimensions of machines predetermines in some cases an increase in the vibration levels of workplaces and a shift in the spectra to the infra-low range. Therefore, in preventing the adverse effects of workplace vibration, an urgent task is to identify the hygienic significance of workplace vibration in the complex of factors in the working environment, to determine the total specific gravity of vibration in the low-frequency range (0.5-4 Hz) in the entire spectrum of mechanical vibrations; the presence of angular movements on transport, transport-technological and technological machines and equipment.

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