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Hygienic Assessment of Noise of Mobile Machinery of Transportation Company in Mining Industry.

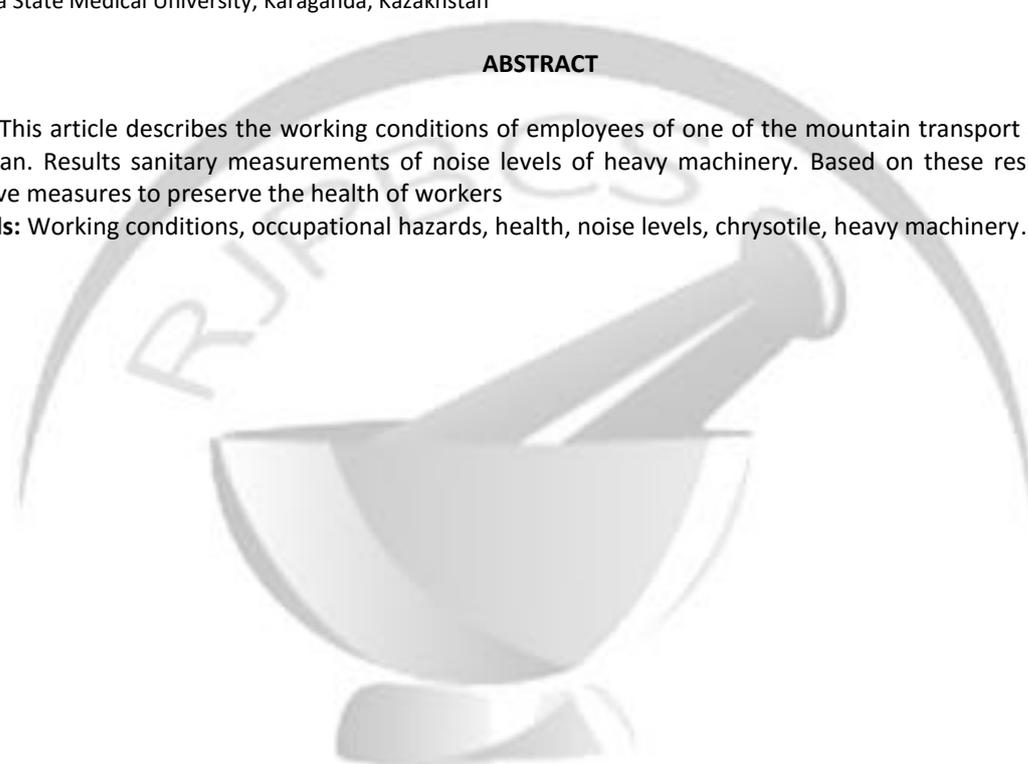
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ABSTRACT

This article describes the working conditions of employees of one of the mountain transport companies of Kazakhstan. Results sanitary measurements of noise levels of heavy machinery. Based on these results will offer preventive measures to preserve the health of workers

Keywords: Working conditions, occupational hazards, health, noise levels, chrysotile, heavy machinery.



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INTRODUCTION

Numerous studies have shown adverse effect on human health of the anthropogenic environmental factors. One of the leading health risk factors are unfavorable working conditions in many industries. Almost one in six workers work in conditions that do not meet sanitary requirements, which largely determines the high level of occupational diseases [1].

In the context of mining production noise is one of the most common occupational hazards, the effects of which are exposed to large numbers of workers on multiple positions, on a variety of industries, including chrysotile asbestos [2].

JSC "Kostanay minerals" is the only company engaged in the production of chrysotile - asbestos in the Republic of Kazakhstan. The raw material base is Dzhetysay deposit in the Kostanay region of Kazakhstan.

It should be borne in mind that the noise being a hindrance to higher nervous activity has an adverse effect on the course of the nerve processes and contributes to the development of fatigue, increases the tension of physiological functions in the labor process and reduces the efficiency of the organism [3].

The aim of the study was to estimate noise levels at the working environment of drivers of mobile machinery in the mining and transport company of JSC "Kostanay minerals".

Materials and Methods: The study included machinists of mobile machinery of the Mining and transportation company of JSC "Kostanay minerals". Noise measurements were carried out on the permanent workplace by sound level meter "Brüel & Kjær" (Denmark), SVAN-949 (Poland-Russia) in the cabins of the excavator, BelAZ, loader, bulldozer. A measurement of sound levels in octave bands and the characteristic "A" [4] of sound level meters were held at 30 workplaces.

RESULTS AND DISCUSSION

Our studies on the hygienic assessment of the noise burden on drivers of heavy mining and transport machinery plant (Table 1.2) were carried out in various modes of vehicles and showed that equivalent noise levels in all workplaces exceeded the maximum permissible levels [4] (movement with and without load, the processes of excavation, loading, drilling) [4,5].

Table 1 - Hygienic characteristic of the noise of heavy machinery

Car brand	Sound pressure levels in dB octave bands with geometric mean frequencies in Hz.									The equivalent level sound dBA
	31.5	63	125	250	500	1000	2000	4000	8000	
Hygienic standards	107	95	87	82	78	75	73	71	69	80
BelAZ 7549-80 tons Loaded	101	95	90,4*	85*	80,5*	80,5*	78*	74	65	85,4*
BelAZ 7549-80 tons Without load	95,2	94,4	90,2*	83,9*	84,8*	77,5*	75,5*	68,3	64,1	84*
BelAZ 7519-110 tons Loaded	95,7	93	85,5	86,3*	84,1*	75,2	71,5	67,9	59,5	86,5*
BelAZ 7519-110 tons Without load	96,5	94,2	86,2	84,2*	81,5*	76,8*	76,8*	65	65	83,5*

Note - * - a deviation from the legal norm

As shown in Table 1 on the BelAZ driver's workplace maximum sound pressure levels occur in octave bands with geometric mean frequencies 250-2000 Hz. The equivalent noise levels at the same workplace make 83,5-86,5 dBA at norm of 80 dBA. [4]

Table 2 - Hygienic characteristics of the noise in the cabin of the excavator

Car brand	Sound pressure levels in dB octave bands with geometric mean frequencies in Hz.									The equivalent level sound dBA
	31.5	63	125	250	500	1000	2000	4000	8000	
Hygiene standards	107	95	87	82	78	75	73	71	69	80
Engine room	101	99*	93,7*	90,3*	88,6*	85,3*	82*	64,3	59	98,5*
EKG 10	100,5	93,5	86,5	86,5*	86,5*	81,5*	76,5*	66,7	64,1	83,5*
Engine room	103	94,5	93,5*	87,5*	87,5*	87*	81,5*	64,4	62,3	97,5*
EKG-6	97	94,2	90*	86*	83,3*	80	75	67	62,3	85*
Engine room	102,4	94,3	93*	85,3*	83,4*	80*	81,3*	68	64	95,7*
EO-5225	98,5	95,5	92,5*	85,5*	81*	80*	74,5*	67,5	63	82,5*

Note - * - a deviation from the legal norm

Excavator driver and assistant driver of the excavator (Tab. 2), depending on the model of the vehicle are exposed to maximum sound pressure level attributable to the octave band with center frequencies of 125-2000 Hz. Equivalent noise levels from 82.5 dBA to 98.5 dBA. When admissible value of 80 dBA.

CONCLUSION

- Thus, the parameters of noise in the workplace mobile machinery drivers are beyond the permissible values, regulated in the Republic of Kazakhstan by the state sanitary norms:
 - at BelAZ drive's workplace equivalent noise levels make 83,5-86,5 dBA. And exceeds the allowable value by the 3.5-6.5 dBA.
 - at the workplace of the excavator operator equivalent noise levels make 82,5-98,5 dBA. That exceeds the norm by 2,5-28,5.
- To the safety department of JSC "Kostanay minerals" were recommended health measures to reduce the adverse effects of noise on the health of workers.

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