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ASSESSMENT OF HEALTH STATUS OF WORKERS IN HAZARDOUS OCCUPATIONS IN UNDERGROUND MINES

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Introduction

Studies have shown an increase in the number of cardiovascular diseases in persons working in heavy labour conditions. The presence of a complex of harmful factors at work, such as heavy physical labour, forced body position, heavy lifting, industrial fervour, vibration and noise. Consequently, the study of the influence of a complex of production harmful factors on the health of workers in the mining industry remains a priority task of public health and is an urgent problem.

Results of the study

We have conducted an in-depth medical examination of 1103 workers of mines Razvedochnaya, Kairagach, Semguron and Samarchuk ARU JSC 'AGMK'. Of these, 710 were underground workers. According to the results of medical examination 15,9% of the workers revealed interstitial-fibrotic changes in lungs (according to chest X-ray), 35,4% of the examined workers revealed chronic bronchitis, bilateral cochlear neuritis in 10,3%, skin diseases in 5,6%, angiodystonic syndrome in 2,1%, lumbar osteochondrosis and disc hernia in 14,8%, anaemia in 13,3%, post-traumatic encephalopathy in 3,4% of the workers. Cardiovascular system pathology was detected in 42% of those examined. Pathology of



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cardiovascular system included hypertension in 30% of the examined and ischaemic heart disease in 12% of the examined. The conducted examination of the cardiovascular system state of the main and control groups revealed a number of shifts in the functional state of individual systems and unfavourable dynamics of indicators with the increase of the professional experience of the examined workers. In the seniority group of 5-10 and more years this index among the examined workers is 2.5 times higher than among the workers of ground areas, the frequency of persons suffering from vegeto-vascular dystonia is 7.2 times higher. Pathology of the cardiovascular system is 2 times more common among tunnellers, machine operators, sawyers, drilling rig operators.

To assess the state of the cardiovascular system we studied lipid metabolism indicators: total cholesterol, triglycerides and β -lipoproteins, we calculated the atherogenicity index $IA = (\text{total cholesterol} - \text{HDL}) / \text{HDL}$, which is an integral criterion of cardiovascular disease risk. Out of all examined 216 people were included in the main group of loading machine operators, tunnellers, fasteners, drilling machine operators, and in the control group (80 people) workers of surface mine sites. The age of those examined was 20-60 years, professional experience from 1 to 20 years. Depending on the duration of professional experience, the workers of the main group were divided into three subgroups: with work experience up to 5 years, 6-9 years, 10 and more years.

The examination of the cardiovascular system of the main and control groups revealed a number of shifts in the functional state of individual systems and unfavourable dynamics of indicators with increasing professional experience of miners. Thus, arterial hypertension was detected in 3.5 per cent of those examined, while in miners and surface workers with professional experience up to 5 years, the frequency of hypertension was not detected, while in the 5-9 years experience group this indicator among miners was 2.1 times higher. The data of workers' examination coincide with the results obtained by analysing the materials of periodic medical examinations for 10 years, according to which the frequency of persons with established diagnosis of hypertension among the examined group of miners is 2 times higher than among workers of surface workshops, the frequency of persons suffering from vegeto-vascular dystonia is 8 times higher.



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Risk factors for the development of cardiovascular pathology are industrial noise, also peculiarities of the work regime, the severity of the labour process, lifting heavy weights, forced position of the body with work inclinations.

Taking into account the essential role of lipid metabolism disorders in the pathogenesis of hypertension, biochemical examinations of workers have established that miners after 5 years of work in underground mine sites have significant shifts in lipid metabolism, which are manifested by an increase in the level of total cholesterol and low-density lipoproteins and especially by a significant increase in the average values of the atherogenicity index, which can also be promoted by pronounced tissue hypoxia due to the high content of n in the blood.

Conclusions

As the professional experience of miners increases, the stress of lipid metabolism becomes more significant and is manifested by changes in a greater number of indicators. Besides shifts in the lipoprotein spectrum, the average content of triglycerides in plasma increases significantly and reliably. The increase of atherogenicity index has a progressive character, the value of which in the group of workers with more than 10 years of experience is almost 2 times higher than the control values.

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