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ANALYSIS OF THE STATE OF HEALTH OF INDUSTRIAL WORKERS

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Professional activity in conditions of influence production factors leads to deterioration of health, occurred in the increase of the morbidity level with temporary disability.

The investigation objective *to study the working conditions of modern lead production and their impact on the level and specificity of morbidity with temporary disability of workers.*

Material and methods. *Determined the work conditions (concentration of dust, gases, aerosols, metal, climate parameters, etc.) of lead production in the modern conditions. To determine the role of working conditions in the formation the characteristics of workers' health and evaluation of the possible impact of production factors conducted the study of morbidity with temporary disability of the largest lead company in Kazakhstan.*

Results and discussion. *In the analysis of morbidity with temporary disability by professional groups, it turned out, that the number of cases and days of disability in all major groups working under study workshops is higher than individuals of subsidiary occupations. The analysis carried out on nosological entity of morbidity showed that the largest specific density fell to respiratory diseases as a whole through the plant, and for each workshop separately.*

Conclusion. *Working conditions of leadplant workers are characterized by complex production factors of increased intensity that can influence on morbidity with temporary disability figures.*

Key words: *work conditions, morbidity with temporary disability, lead company.*

Professional activity in conditions of influence production factors leads to deterioration of health, occurred in the increase of the morbidity level with temporary disability. Analysis of morbidity with temporary disability, its structure and changes in the dynamics allows to define group of professionally associated diseases and reasonable to carry out preventive and recreation activities in high-risk groups [1, 2].

Technological processes of lead production, particularly when high temperatures and open surfaces of the molten metal accompanied by a significant entering in air the working zone of large quantities of chemical components such as lead, zinc, cuprum, cadmium, ferrum, arsenic, tellurium and others. It is reflected, of course, on the sanitary conditions of leadplant.

Earlier completed research shows a direct connection the high values of morbidity rate with temporary disability and the impact on the body of working adverse production factor [1].

In previous years, the level of morbidity with temporary disability on lead production was very high, reaching 111,3-121,3 cases on 100 year-round workers. Due to the fact in the following years improved technological processes, equipment, and improved hygienic conditions, it was necessary to conduct in-depth study of morbidity with temporary disability workers at the present stage in the leadplant.

Objective

To study the working conditions of modern lead production and their impact on the level and specificity of morbidity with temporary disability of workers.

Material and methods

Determined the work conditions (concentration of dust, gases, aerosols, metal, climate parameters, etc.) of lead production in the modern conditions. To determine the role of working conditions in the formation the characteristics of workers' health and evaluation of the possible impact of production factors conducted the study of morbidity with temporary disability of the largest lead company in Kazakhstan.

An in-depth analysis of morbidity with temporary disability was by the method of bank account on 100 year-round workers, which allowed to determine the basic features: the number of cases and disability days, the average duration of the one case, the number of ill people, frequency, repeatability, repetition of morbidity, also features of the morbidity structure in cases and days of the classes of morbidity with reference to the nomenclature of the International classification WHO diseases of tenth

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revision from № 551 12/03/96 MH of RK. The maternity leaves and medical certificates to care for patients were excluded from the development [2, 3].

An in-depth development of morbidity with temporary disability of leadplant "Kazzinc" JSC was held for three years.

Results and discussion

Analysis of the morbidity in three years as a whole on plant was 88.1 cases and 911.2 days of disability on 100 year-round workers. Influence of production and occupational factors on morbidity with temporary disability was especially pronounced in the differential study of morbidity levels on individual occupational groups.

The highest level of with temporary disability on the main workshops was reported among workers charge sintering plant – 93,05 events and 1116,9 days of disability, slightly lower in the melting – 86,2 cases and 925,4 days in the of disability. The lowest level of with temporary disability – in the refining shop – 84,6 cases and 691,2 days of disability.

The findings clearly show a significant decline in recent years of morbidity with temporary disability on lead production as compared with the previous years.

However, even these figures were much higher than in other industrial enterprises. For example, in machine workshops of leadplant, which control the number of cases was equal to 67,3, and disability days – 584,1 on 100 year-round workers.

In the analysis of morbidity with temporary disability by professional groups, it turned out, that the number of cases and days of disability in all major groups working under study workshops is higher than individuals of subsidiary occupations (table 1). The reason is that the staff work of the main professional group is in the most connect with adverse effects on health factors of production with constant exposure to the environment.

This is particularly demonstrated in the workshop of sintering charge, where were the most adverse working conditions (95,8 cases and 1260,5 days of disability –the main occupation workers against 89,01 cases and 915,5 days of disability – subsidiary occupations). In the melting workshop the morbidity rates of main occupation workers is different from data of the subsidiary is less significant (90,1 vs. 82,3 cases on 100 year-round workers). This circumstance is explained by the fact that the subsidiary occupation workers in this workshop work in the same adverse conditions as the leading occupation workers.

An identical picture is observed in the refining workshop: of main occupation workers – 88,1 cases and 708,5 days of disability, of the subsidiary – 81,1 cases and 668,5 days of incapacity on 100 year-round workers.

As for morbidity with temporary disability figures of control group workers, they are small and are not differ significantly from each other (69,6 vs. 64,8 cases of disability).

The analysis carried out on nosological entity of morbidity showed that the largest specific density fell to respiratory diseases as a whole through the plant, and for each workshop separately.

In the melting workshop, the respiratory pathology was 37,6 cases for 361,3 days of disability (Table 3), in the refining workshop – 30,6, and 214,0, respectively (Table 4). In the sintering charge workshop registered the highest rates respiratory morbidity – 42,1 cases and 471,3 days of disability on 100 year-round workers.

Inside of this class, the leading place belongs in all the main workshops of lead production to acute upper respiratory tract infection (URTI), which indicates the presence adverse microclimate conditions and sudden changes in temperature in the workshops. At the same time, the highest morbidity rates marked in the sintering charge workshop (acute infection URTI was 20,1 cases and 62,3 days of disability) and the melting shop (acute infection URTI – 18,2 cases and 58,6 days of disability). In the refining workshop figures of acute infection URTI were – 14,4 cases – 88,9 days of disability.

Thus, in the structure of respiratory system morbidity in the sintering charge workshop, future ranking places belong to pathology bronchus, bronchioles, and the lung parenchyma: acute and chronic bronchitis – 6,1 and 3,2 cases, respectively, of pneumonia – 3,1 cases. This indicates interconnection with the impact of dust and gas complex on the bronchopulmonary system, and adverse micro-climatic conditions are a contributory factor. Chronic pathology of the respiratory system in this workshop was 43,3% of this system pathology.

Table 1 – **Morbidity with temporary disability figures on the main workshops of lead production on average in three years by occupations on 100 year-round workers**

№	The name of workshops and working professions	Morbidity rate of the workshops		
		Cases	Days	The average duration of one case
1	Sintering charge			
	Main	95,8	1260,5	13,1
	Auxiliary	89,01	915,5	10,3
	Total	93,05	1116,9	12,01
2	Melting			
	Main	90,1	971,2	10,9
	Auxiliary	82,3	879,8	10,6
	Total	86,2	925,4	10,7
3	Refining			
	Main	88,1	708,5	8,0
	Auxiliary	81,1	668,5	8,2
	Total	84,6	691,2	8,1
4	In general of the workshops			
	Main	92,6	981,4	10,7
	Auxiliary	82,8	823,2	9,9
	Total	88,1	911,2	10,4
5	Mechanical (control)			
	Main	69,6	602,3	8,7
	Auxiliary	64,8	565,9	8,5
	Total	67,3	584,1	8,6

In second rank place were the diseases of bones and joints, which traced a clear dependence on age and experience in all plants we observed. In the sintering charge workshop diseases of bones and joints were – 17,9 cases and 173,8 days of disability on 100 year-round workers, the melting – 16,4 cases and 131,4 days of disability on 100 days a year-round workers and in the refining workshop – 15 3 and 96,8, respectively.

A significant percentage of disease among workers of the studied plants fell on diseases of the digestive system, nervous system and blood circulation. Moreover, in the sintering charge workshop of and in the refining workshop 3 rank place belonged to diseases of the digestive system, and the melting – disease of the circulatory system. In the sintering charge workshop, the digestive diseases were 8,9 cases and 131,1 days of disability, in the refining workshop – 7,6 cases and 89,3 days of disability. The diseases figures of the cardiovascular system in the melting workshop were the highest – 11,87 cases and 85,8 days of disability, in the refining workshop took an intermediate value – 6,7 cases and 60,1 days of disability, in the sintering charge workshop – minimal – 3,4 cases and 51,4 days of disability. At the same time, hypertension belonged to the first rank place within this class in all the main workshops of lead production, which is associated with spastic effect of lead on the cardiovascular system.

The next ranking places were diseases of the nervous system, trauma, skin and subcutaneous tissue.

Due to findings, we tried in more detail to understand the causes defining features of the identified morbidity structure with temporary disability.

In all the studied shops, largest specific density fell to respiratory diseases. In this case, the higher incidence found in the shop of the sintering of the charge, which is largely due to adverse microclimatic conditions, especially during the cold period of the year, and high air-pollution work area of polymetallic dust (containing silica) and the gases are irritating and toxic effect on bronchopulmonary system. Special attention should be nasal disease, bronchitis and pneumonia.

A significant specific density of the circulatory system pathology in the melting shop, due, seems to, the impact on the body working higher air temperatures and thermal radiation compared to other shops of lead production and performance while labor-consuming physical operations.

Growth of digestive and nervous system diseases, obviously, can explain entering the gastrointestinal tract a number of heavy metals, in particular lead, zinc, and sodium hydroxide, niter, sulfur dioxide and others that aggravate irritating effect of metals on the mucous membrane of digestive system...

High levels of skin and subcutaneous tissue, apparently caused, with the introduction of molten black lead at different stages of refining – cleaning of lead from bismuth, copper extraction , cleaning of lead from tellurium, desilvering and other – of substances (aluminum chloride, sodium hydroxide, etc.) having a primary irritant and sensitizing properties. One of the indirect evidence of communication of allergic skin diseases, accompanied by the temporary disability, the influence of working conditions is a significant increase in the number of allergic dermatomes with increasing experience of work in a workshop: 2,0 cases on 100 year-round workers with work experience of up to 5 and 9,1 years – with a larger work experience.

A large number of osteochondrosis cases of the main occupation workers, can obviously be linked to intensive physical activities, forced working posture, also a high rate of airflow in production areas of workshops.

Level of morbidity with temporary disability figures was in direct proportion to the experience and age of workers: the number of cases and days of disability, also the duration of one case in all the main workshops of lead production increased in parallel with the increase in the number of years and the worker experience, reaching the maximum level in the experience group 10 and more, age group 40 and more.

Thus, the analysis of morbidity with temporary disability gave the possibility to define the level of specificity and, depending on the technological conversion, occupation, age and experience of the workers. At the same time, the special place occupied charge-sintering plant, where there was the most significant effect of adverse production factors combination, micro-climatic conditions and intensive physical labor.

Conclusions

1. Working conditions of leadplant workers are characterized by complex production factors of increased intensity that can influence on morbidity with temporary disability figures.

2. The morbidity with temporary disability structure leading positions belong to respiratory diseases, musculoskeletal, digestive, circulatory, skin and subcutaneous tissue. At the same time, the number of disease increase with long experience workers that demonstrates the adverse impact of working conditions on their course.

3. Decreasing morbidity with temporary disability can only be achieved through an integrated implementation of health measures, with particular attention should be paid to the prevention of respiratory diseases.

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ТҰЖЫРЫМ

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КӘСІПОРЫНДАҒЫ ЖҰМЫСШЫЛАРДЫҢ ДЕНСАУЛЫҚ КҮЙІНІҢ АНАЛИЗІ

Жұмысшылардың денсаулық күйінің бұзылуы өндіріс факторлардың әсерінен пайда болады, соған байланысты

уақытша еңбекке жарамсыздыққа әкеп соғатын аурушаңдық деңгейі көтеріледі.

Зерттеудің мақсаты. Қазіргі жағдайдағы қорғасын өндірісіндегі еңбек жағдайларын және олардың уақытша еңбекке жарамсыздыққа әкеп соғатын аурушаңдық деңгейі мен ерекшелігін зерттеу.

Материал және әдістері. Қазіргі жағдайдағы қорғасын кәсіпорындағы өндірістің еңбек жағдайлары (шаңның, газдардың, металл аэрозольдардың шоғырлануы, микроклиматтың параметрлері, т.б.) зерттелді. Жұмысшылардың денсаулық сипаттамаларын қалыптастырудағы және өндіріс факторлардың мүмкін болатын әсерлерін бағалаудағы еңбек жағдайларының рөлін анықтау үшін Қазақстанның ірі қорғасын кәсіпорындағы жұмысшылардың уақытша еңбекке жарамсыздық аурушаңдығы зерттелді.

Нәтижелері және талқылау. Кәсіптік топтардағы уақытша еңбекке жарамсыздық аурушаңдылықтың анализі келесіні көрсетті: зерттеуге алынған цехтарда қосымша топтармен саластырғанда еңбекке жарамсыз жағдайлар мен күндер санының ең үлкен деңгейі негізгі топтардың жұмысшыларында кездесті. Аурудың нозологиялық түрлері бойынша жүргізілген анализ көрсеткендей, тыныс алу органдары ауруының меншікті салмағының үлесі зауыт бойынша да, жекелеген цехтар бойынша алғанда да көп болып отыр.

Қорытынды. Қорғасын өндірісі қарқындылығы жоғары өндіріс факторлар кешенімен сипатталады, уақытша еңбекке жарамсыздық аурушаңдылық көрсеткіштеріне әсер етеді.

Негізгі сөздер: *өндірістің еңбек жағдайлары, уақытша еңбекке жарамсыздық аурушаңдылығы, қорғасын өнеркәсібі.*

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АНАЛИЗ СОСТОЯНИЯ ЗДОРОВЬЯ РАБОЧИХ ПРОМЫШЛЕННОГО ПРЕДПРИЯТИЯ

Профессиональная деятельность в условиях воздействия производственных факторов приводит к нарушениям состояния здоровья работающих, проявляющимся в повышении уровня заболеваемости с временной утратой трудоспособности.

Цель исследования. Изучить условия труда на современном свинцовом производстве и их влияние на уровень и специфику заболеваемости с временной утратой трудоспособности рабочих.

Материал и методы. Изучены условия труда (концентрации пыли, газов, аэрозолей металлов, параметры микроклимата и т.д.) на свинцовом производстве в современных условиях. Для выявления роли условий труда в формировании характеристик здоровья работающих и оценки возможного влияния производственных факторов проводилось изучение заболеваемости с временной утратой трудоспособности рабочих крупнейшего свинцового предприятия Казахстана.

Результаты и обсуждение. При анализе ЗВУТ по профессиональным группам оказалось, что число случаев и дней нетрудоспособности во всех основных группах работающих изучаемых цехов более высокое, чем у лиц вспомогательных профессий. Анализ, проведенный по нозологическим формам заболеваемости, показал, что наибольший удельный вес падал на болезни органов дыхания как в целом по заводу, так и по каждому цеху отдельно.

Вывод. Условия труда рабочих свинцового завода характеризуются комплексом производственных факторов повышенной интенсивности, способных оказывать влияние на показатели ЗВУТ.

Ключевые слова: *условия труда, заболеваемость с временной утратой трудоспособности, свинцовое предприятие.*

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