

Original Article

Study of the Functional Status of Workers in the Main Professional Groups in Plastic Manufacturing Enterprise and Experimental Investigation of Inflammation Processes in Production

Guzal Tulkinovna Iskandarova¹, Shakhnoza Irkinovna Kurbanova²,
Guzal Fakhritdinovna Sherkuzieva³, Maksud Atabaevich Sobirov⁴,
Dilshod Shukhratovich Sabirov⁵

¹DSc, Professor, Tashkent Medical Academy
<https://orcid.org/0000-0001-6672-1431>

²PhD, docent, Tashkent Medical Academy
<https://orcid.org/0000-0002-2794-4744>

³PhD, docent, Tashkent Medical Academy
<https://orcid.org/0000-0003-2564-6329>

⁴DSc, Professor Tashkent State Institute of Dentistry
Natalya Vladimirovna Voronina, DSC, docent
<https://orcid.org/0000-0003-3353-6031>

⁵1 year (stage) doctoral student, Tashkent Pediatric Medical Institute
<https://orcid.org/0000-0001-8218-5720>

Email: ¹guzaliskandarova13@gmail.com, ²shahnoza.kurbanova5@gmail.com,
³guzal.sherkuzieva@gmail.com, ⁴natyza@mail.ru, ⁵sabirov7@internet.ru

ANNOTATION

Noise and vibration during the work process in the workshops of the plastic production company caused an increase in the heart rate, an increase in the pulse and minute volume of the heart, a decrease in the pulse pressure, an increase in the maximum arterial pressure and a decrease in the minimum arterial pressure. Unfavorable microclimatic conditions affecting the body of workers, increase in noise level above the norm, cause neuro-emotional stress and mobilize functional reserves in the cardiovascular system of workers. Thus, constant noise in the enterprise also affects the auditory motor response. In the first half of the working day under the influence of constant noise, adaptation in auditory analyzers and shortening of the latent time of the auditory motor reaction in workers, and at the end of the working day, fatigue occurs in the body, which indicates that the latent time of the auditory motor reaction is prolonged.

When we checked the performance of the vision analyzer in the workers at the enterprise, it was observed that fatigue occurs during the work process, and the functional state of the vision analyzer decreases.

It should be noted that allergic inflammatory processes are observed in workers at plastic production enterprises as a result of contact with plastic products during the working day. In order to prevent and reduce this inflammatory process, the tool "Netinfla" was studied in experimental studies. This tool caused a 67.5% reduction in inflammation compared to the control group.

Keywords: physiological examinations, cardiovascular system, auditory motor reaction, visual motor reaction, ability to conduct visual analyzer, chronoreflexometry.

1. INTRODUCTION

The comprehensive, well-thought-out and well-thought-out policy pursued to reform our country, first of all, liberalize and modernize economics, to diversify its structure, has created a strong barrier that can protect us from the negative effects of crises and other threats, arguably a solid and reliable means of protection [2,3].

One of the main sectors of the country's national production is industry. Industry differs radically from other industries and sectors by its added value, its role in meeting the needs of the population, and its high level of production capacity. Industry is the main and leading branch of material production, the development of which leads to the sustainable development of the national economy. The production of plastic products from industrial enterprises is one of the most popular industries today [7,8,9].

Plastic products are now widely used in production due to their unique physicochemical properties, mechanical and thermal resistance, as well as non-corrosion resistance. Over the past 15 years, the production of plastic products has reached 120 million tons per year. In its production, harmful and dangerous factors that pose a threat to human health are released into the environment in the form of toxic gases, vapors and dust [1,10]. It also leads to the emergence of new factors of production that have not been studied before. This, in turn, has a negative impact on the health of workers.

Factors of production affect the functional state of the body of workers, the level of activity, as well as the occurrence of general and occupational diseases. In addition, allergic inflammation leads to the development of processes in the body [4,5,6].

2. RESEARCH METHODS

To study the functional status in the body of workers in the main occupational groups, workers who were healthy and did not show any symptoms of the disease in the assessment of the results of the examination were selected for physiological examinations. Inspections were conducted for 2 weeks in the dynamics of the working day (before work, before lunch and at the end of the working day) during the warm and cold periods of the year.

In the study of functional conditions of the cardiovascular system, heart rate (using palpation and pulsotometer), tonometry (Korotkov's method), systolic, diastolic and pulse pressures were determined. The pulse and minute volume of blood were calculated using the Starr formula.

$$100SVB = 100 + 0,5 SP - 1,1 DP - 0,6 Y$$
$$MVB = SVB * PR$$

At this:

SVB is the shock volume of blood;

SP and DP - systolic and diastolic pressure, mm of mercury. ust.;

Y is the age of the worker, in years;

MVB is the minute volume of blood in ml;

PR - pulse rate in minutes.

All receptors in the body are actively involved in mental work. Because the load in many professions falls on several receptor systems, we have 2 receptor systems: latent cycles of auditory and visual reactions, S.I. The method of chronoreflexometry was used using a

universal chronoreflexometer of Gorshkov's design. The functional status of the imaging analyzer was studied from the Landold ring table. The results of the inspection are evaluated by the number of uncounted rings and the time taken to view the table.

The throughput of the vision analyzer was calculated using the following formula.

$$S = 358,8 - Ln/T$$

S - vision analyzer bandwidth, bit / sec;

358.8 bits is the amount of data in the table;

L - the number of data lost when skipping a single ring;

n - the number of rings passed;

T - the time taken to count the number of rings in the table.

Netinfla was administered to experimental animals 1 hour before injection in the stomach at a rate of 10 ml / kg body weight. The size of the hind legs of the animals was studied using a plethysmometer № 37140 from Hugo Basile (Italy). The anti-inflammatory activity effect of the tool was assessed using an inhibition index.

3. RESULTS OF PERSONAL EXAMINATION

Any labor, regardless of the type of labor, is controlled and managed by man. Energy is expended in any type of work, physiological shifts are observed in the body. Changes in muscle activity, respiratory and circulatory systems are observed during physical activity. The nervous system is mainly involved in the type of mental work, and to a lesser extent the metabolism is enhanced. Each of these species affects the positive part of the brain, etc., to a greater or lesser degree of participation of the system in the mechanization phase to the views that take into account the technological process.

We studied the functional state of the organism for the warm and cold periods of the year of workers working in the main shops at the enterprise for the production of plastic products. Inspections were conducted in the dynamics of the working day before work, during the working day, at the end of the working day.

The cardiovascular system is affected by various processes in the body, as well as supplies blood to all organs and tissues in the body. Therefore, as a result of the combined effect of various factors of production on the body of workers, the state of the cardiovascular system does not change: high temperature, noise, gasification, "standing" and "sitting", working shifts, high-speed operations and others.

The warm climate of the year The data obtained on the indicators of the cardiovascular system of workers in the workshops of the plastics plant show that in the warm period of the year during the working day increases pulse rate and pulse pressure, which in turn mobilizes functional reserves in the cardiovascular system. ensures that At the end of the workday, it was found that the pulse in the workplaces of operators increased by 83, while in the workplaces of foundries increased by 86 per minute. An increase in maximum and minimum pressure was also observed. The study of heart rate and minute blood flow in the dynamics of the working day showed the following results: heart rate decreased to 51 ml per minute in the workplace, 4233 ml per minute in the workplace, and heart rate decreased from 49.8 ml to 47 ml in the workplace. the minute volume of blood was found to increase from 3635 ml to 4059 ml per minute.

The cardiovascular system was observed in the same group of workers for the cold period of the year with an acceleration of the pulse in the same profession.

In employees who work in relatively good conditions and do not come into contact with harmful and hazardous factors, ie in the first half of the working day, the minimum pressure is 73 mm sim.ust. increased to 72 mm.sim.ust. at the end of the working day. The minute volume of blood increased from 57.5 ml to 61 ml, and the pulse volume increased from 4180 ml to 4730 ml per minute.

It should be noted that the results of the analysis of the cardiovascular system in the workers of the enterprises we studied led to an increase in pulse, an increase in heart rate and minute volume, a decrease in pulse pressure, an increase in maximal blood pressure and a decrease in minimum arterial pressure. Unfavorable microclimate affecting the body of workers, increased noise in production, neuro-emotional stress mobilizes functional reserves in the cardiovascular system in workers, leading to adaptation to external environmental conditions and occupational labor.

In order to fully study the effects of working conditions and type of work on the central nervous system in the body of workers, the latent response time of the analyzer to heat, sound and vision was studied using the method of chronoreflexometry. Detection of latent time of visual motor reaction (VMR) was carried out in extrusion machine operators belonging to accountants performing high-precision work (category III) and low-precision work (category V).

The results of the inspection showed that for the warm period of the year, the VMR was 315 ms for accountants and 273.4 ms for extrusion machine operators before work.

In most cases during the workday, the visual-motor response is slightly prolonged relative to the background level. At the end of the working day, the visual-motor reaction: in accountants - increased by 28%. During the cold period of the year, the latent time of the VMR was extended compared to the warm period of the year. In the first half of the working day, VMR in accountants increased from 315 ms to 403.3 ms, while in the cold period of the year in the first half of the working day it increased from 317.1 ms to 406.2 ms. was found to be elongated. At the end of the working day, the latent time of VMR was clearly increased by 28% in accountants and by 23% in extrusion machine operators compared to the previous figure.

It should be noted that the VMR increased during the working day in workers and employees of different professions, which in turn is due to the process of braking in the central nervous system, which leads to fatigue in production. A similar situation was observed in determining the latent time of the auditory motor response (AMR). The latent time of the auditory motor reaction was examined in occupational groups (extrusion machine operators, casting site workers) related to the effects of noise during operation. The latent time of the AMR was extended from the beginning of the working day to the end of the working day. For example, AMR in extrusion machine operators was 282.7 mls at the beginning of the working day in the warm season and 288.1 mls in the cold season. At the end of the working day, 359.5 mls to 353.5 mls for the warm period of the year. indicates an increase in In the warm season, the number of workers at the filling station was 358.1 mls at the beginning of the working day and 352.3 mls at the beginning of the cold season. At the end of the working day, 449.7 mls for the warm period of the year and 441.5 mls for the cold period of the year. found to have increased.

Thus, the results of the inspection show that workers in the enterprise work under the influence of constant noise, in which the exposure of constant noise adjusts the hearing analyzers in the first half of the working day and reduces the latent AMR time, and at the end of the working day.

In order to determine the effect of illumination in production on the body of the worker, we identified some indicators that characterize the functional state of the visual

analyzers during the working day. Image Analyzer Information Transmission Ability (AITA) - Landolt studied using ring tables. In the first half of the workday, as well as at the end of the workday, it was observed that the number of errors missed by all workers, as well as the time spent on viewing the rings in the Landolt table, increased significantly compared to initial figures. In the first half of the working day, in the warm period of the year, accountants were found to have increased by 0.28 bits/s, and at the end of the working day, the AITA was found to have increased by an average of 25%.

Based on the results of the inspection, we came to the following conclusion: as a result of the labor process, workers experience fatigue during the production process, depending on the performance of the AITA. The cause of fatigue is working in conditions of insufficient and improperly distributed lighting in the workplace, which in turn reduces the functional status of the vision analyzer in workers working in the enterprise during the working day.

It can be concluded that the complex effect of factors of production on the workers of the enterprise leads to fatigue in the production process as a result of the severity of the labor process, improper organization of work and rest.

In addition, as a result of contact with plastic products during the working day in the plastics industry, allergic inflammation leads to the development of processes in the body.

In order to prevent and reduce this inflammatory process, Netinfla has been studied in experimental studies. Studies have been performed on 36 Wistar species of bisexual white rats with an average weight of 175–185 g. In the experiment, an aqueous solution of 0.1 ml of 6% dextran was injected once into the hind legs of an animal subplantarno to induce inflammation in animals. Netinfla was administered to experimental animals 1 hour before injection in the stomach at a rate of 10 ml/kg body weight. Studies have shown that Netinfla reduces inflammation by up to 67.5% compared to the results obtained in the control group.

4. CONCLUSION

In summary, fatigue in the main occupations of workers in the shops of the enterprise occurs as a result of work, especially in the second half of the working day, as well as in the warm period of the year. The aim of our research is to develop and implement hygienic recommendations for functional changes in the body, ie stress on the visual analyzers, changes in the auditory motor response due to high noise levels, improving working conditions, improving work capacity and preventing fatigue and Netinfla reduces inflammation by up to 67.5% compared to the results obtained in the control group.

5. REFERENCES

1. Бухтияров И. В., Матюхин В. В. Физиология труда: теоретические и научно-практические аспекты современности // Российский физиологический журнал им. И. М. Сеченова. – 2014. – Т. 100. – № 10. – С. 1118-1129.
2. Быковская Т. Ю. Роль национального проекта “Здоровья” в улучшении здоровья работающего населения. // Медицина труда и пром. экология. – 2011. – № 3. – С.19-23.
3. Гильмундинов В. М., Казанцева Л. К., Тагаева Т. О. Оценка влияния экологического фактора на ухудшение общественного здоровья // Вестник НГУ. Серия: Социально-экономические науки. – 2013. – Вып. 3., Т. 13. – С. 39-48.

4. Головкова Н. П., Чеботарев А. Г., Лескина Л. М. Отраслевая медицина труда как основа сохранения здоровья работающих // Медицина труда и промышленная экология. – 2013. – № 6. – С. 25-29.
5. Дашинамжилов Ж. Б., Петров Е. В. Противовоспалительное действие фитосредства «Панкреофит» // Сибирский медицинский журнал. – 2015. – № 1. – С. 103-105.
6. Романова Ю. Г., Лепский В. В., Жижикин О. И. Частота проявления аллергических реакций в полости рта на акриловые пластмассы // Вестник стоматологии. – 2011. – № 2. – С. 78-80.
7. Самыкина Л. Н., Косова Л. Н., Ибрагимов И. М. Некоторые аспекты адаптационных механизмов защиты у рабочих на производстве полимеров. // Известия Самарского научного центра Российской академии наук. – Самара, 2010. – Т. 12, №1 (6). – С. 1783-1786.
8. Семина Е. В., Розенцвет О. А. Профилактика профзаболеваний у работающих во вредных условиях труда, как средство для обеспечения устойчивого развития // Поволжский экологический журнал. – 2014. – № . – С. 158-164.
9. Степнова С. И. Совершенствование теоретико-методических основ управления организационным развитием химических предприятий // Вестник МИТХТ. – 2013. – № 1. – С. 96-102.
10. Шардакова Э. Ф., Матюхин В. В., Ямпольская Е. Г., Елизарова В. В., Лагутина Г. Н., Андреева Е. Е. Профилактика риска развития перенапряжения организма работников физического труда в зависимости от класса условий труда по показателям тяжести трудового процесса // Медицина труда и промышленная экология. – 2012. – № 1. – С. 23-29.