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OPTIMIZATION OF THE PREVENTION OF DENTAL DISEASES IN MECHANICAL ENGINEERING WORKERS

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ABOUT ARTICLE

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Abstract: In the process of intensive industrial development, the study of the role of harmful and health-related factors of the production environment is timely and very important. After all, unfavorable working conditions contribute to the formation of various pathological processes in the human body (Amirov N.H., 2016). The long-term influence of a complex of production factors simultaneously with the deterioration of the health of workers, as a rule, can lead to pathological changes in the mucous membrane of the oral cavity, periodontal diseases, hard tissues of teeth (Galiullin A.N., 2014).

INTRODUCTION

One of the most numerous contingents exposed to the harmful effects of working environment factors are mechanical engineering workers. The intensity of the impact of factors of the working environment and the labor process causes a high risk of health disorders for workers in this sector of the economy.

According to research data, employees of these enterprises are affected by a complex of factors of the working environment and the labor process: industrial noise, vibration, unfavorable microclimate parameters, air pollution of the working area with dust and harmful substances, lack of natural lighting, as well as significant physical exertion (Teregulova Z.S. et al., 2013; Shaikhlislamova E.R. et al., 2017).

It has been established that harmful working conditions have a negative impact on the health of mechanical engineering, and cause them to outstrip the growth of diseases of the musculoskeletal and peripheral nervous system, cardiovascular system, the development of myocardial infarctions, cerebral strokes, as well as osteopenia (Nurgaleev N.V. et al., 2013; Kudasheva A.R. and et al., 2013; Teregulova Z.S. et al., 2019).

According to recent studies, an excess of toxic compounds, including heavy metals, has been revealed in the body of workers (Farshatova E.R. et al., 2014; Semenova I.N., 2015).

At the same time, there is still no reliable information about the structure of dental morbidity of mechanical engineering workers, depending on the degree and duration of contact with harmful production factors. There is insufficient information about the impact of harmful factors of the working environment on dental tissues, periodontal tissues and oral mucosa, and there are no clear recommendations for the prevention of dental diseases in such enterprises. All of the above confirms the need to study the dental status of workers engaged in the extraction and processing of copper-zinc ores exposed to harmful factors of the working environment.

To optimize the treatment process, with the development of dental technologies, new progressive techniques are emerging to improve the quality of life of patients with inflammatory periodontal diseases. Modern methods of complex etiopathogenetic treatment of inflammatory periodontal diseases, including conservative, orthopedic, orthodontic and surgical measures, are presented. The inclusion of systemic and local drugs in the treatment regimen of chronic generalized periodontitis is justified. Dental procedures are proposed (in particular, professional oral hygiene with the new Vector ultrasound machine) aimed at preventing and stabilizing the inflammatory process in periodontal tissues while observing the rules of rational individual oral hygiene at home.

Recently, periodontal diseases have become increasingly the reason for going to the dentist, due to premature tooth loss, decreased quality of life due to bad breath, bleeding gums and dental hyperosthesia. Therefore, inflammatory periodontal diseases (VZD) are attracting increasing attention from doctors. Their high prevalence in the population, exceeding 85-98% according to various authors, significant degenerative transformations in the maxillofacial system require optimization and improvement of methods for detecting and treating this pathology [9, 13, 43].

Chronic generalized periodontitis of moderate severity is the most common form of periodontal disease detected in patients over 40 years of age. Its high prevalence is largely due to the lack of necessary monitoring for young people (19-24 years old), who most often have the initial stages of inflammatory

periodontal lesions that do not cause serious complaints and a complete understanding of the problem. Most middle-aged patients go to the dentist complaining about the appearance of blood when brushing their teeth and swelling of the gums, swinging teeth and other obvious signs that characterize inflammatory and destructive changes. All this prompted us to develop a new treatment method specifically for this population.

The planktonic biofilm contains microorganisms that cause and support periodontal diseases with the products of their vital activity. In turn, the biofilm is attached to the tooth tissues by means of a matrix containing bacterial microflora. [1, 7]. Therefore, the therapy of periodontal diseases begins with the removal of plaque, the removal of mineralized deposits from all surfaces of the tooth and the elimination of biofilms. For this, periodontists use hand tools and ultrasound devices. On the one hand, the complex of therapeutic measures for this pathology is diverse and provides therapeutic, orthopedic and, if necessary, surgical methods; on the other hand, practical experience shows that sometimes only the removal of dental deposits at the initial stage of the process and normalization of oral hygiene can stop and bring periodontal structures to a state of normality. However, in the presence of concomitant pathology or with a more severe course of the disease, this becomes insufficient.

For many years, a minimally invasive hardware complex has been leading in therapy and prevention, based on ultrasonic grinding and polishing of the root surface with hydroxylapatite (NA) with a particle size less than 10 microns (BY < 10 microns), since its use is an almost painless treatment due to the desensitizing effect of the suspension. Through it, it is possible to solve such complex tasks as the elimination of biofilm, granulation tissue, dental plaque, endotoxins, deepithelization of the inner wall of the periodontal pocket, polishing of the root without excessive removal of cement, which is important for the regeneration of tissue structures, as well as the rapid and effective elimination of bacteria causing the pathological process. Remission of the disease becomes possible due to the gentle treatment of the dentoalveolar pocket with hydroxylapatite (AT < 10 microns), during which the ultrasonic vibrations of the instrument are ordered by a resonant ring, and therefore the treated surfaces of the root and surrounding soft tissues retain their state unchanged for a long time after treatment. All this is due to the uniqueness of the transmission of the hydrodynamic effect of ultrasound through a hydro shell from water and a suspension of hydroxylapatite. A wide variety of shapes of the working part of the tool ensures effective and atraumatic grinding of the root with hydroxylapatite (<10 mm) in anatomically difficult areas. In addition, it is possible to prevent the spread of infection in a medical facility. Due to the absence of oscillatory movements of the instruments, the infected aerosol is not sprayed from the oral cavity into the environment [3, 9,17]. It is important to note that the positive

effect of treatment manifests itself after the first procedure: there is a decrease in pain, bleeding, and suppuration [2, 6, 9].

However, plaque control measures are effective in combination with conservative treatment, an important part of which is antibacterial therapy due to the infectious etiology of the disease. Due to the increased incidence of resistance to antibiotics and antiseptics, the search for new antimicrobial agents is an urgent problem. As studies have shown, after ultrasonic grinding of the root with hydroxylapatite (<10 microns), the number of neisseria, peptostreptococcus, propionibacteria decreases in the periodontal pocket, Corynebacterium spp. almost completely disappear, and the anaerobic flora of the subgingival region is depleted; Lactobacillus spp., representatives of the convoluted forms of Spirochetes spp. are not found before treatment.

The purpose of the study: to increase the effectiveness of prevention and treatment of periodontal diseases in mechanical engineering workers.

Research objectives

1. To study the dental and hygienic status of mechanical engineering workers.

2. To identify the influence of working environment factors on the state of the microelement composition of oral fluid in mechanical engineering workers

3. To assess the state of local immunity in mechanical engineering workers.

4. To improve the complex of therapeutic and preventive measures for patients with chronic generalized periodontitis in mechanical engineering workers and evaluate their effectiveness.

Materials and methods of research. We will select 110 people working in the main workshops of machine-building production with generalized periodontitis of mild and moderate severity. Among them, 45 workers will receive traditional (control group), 65 – the comprehensive advanced treatment we have proposed.

The following methods will be used:

a) epidemiological;
b) clinical and functional;
c) biochemical;
d) immunological;

e) statistical methods.

The results of the study

The influence of production risk factors on the level of dental health of workers will be revealed.

A correlation will be established between harmful factors and the development of periodontal diseases.

It will be revealed that dental caries, generalized periodontitis of various degrees of severity, catarrhal and ulcerative forms of gingivitis are most common among workers in the main professions.

A medium-strength correlation will be established between harmful substances in the air and the activity of alkaline and acid phosphatase in saliva.

The conducted research will show the high effectiveness of complex treatment of periodontal tissue diseases.

CONCLUSION

1.Among the workers of the main specialties exposed to a complex of harmful substances in mechanical engineering workers, a high prevalence and intensity of major dental diseases were determined: the YLU index averaged 17.7±1.44, the prevalence of periodontal tissue diseases was 94.5±2.34%, and the oral mucosa was 95.5±3.2%.

2. According to the results of the evaluation of the coefficient of balance of local immunity factors, it was revealed that 53.5±1.25% of workers had a pronounced imbalance ($p<0.001$). The indicators of the adsorption reaction of microorganisms by epithelial cells of less than 40.0±1.55% indicated an unsatisfactory functional state of the body ($p<0.001$).

3. The leading harmful factors of the working environment and the labor process for workers, the main professions of mechanical engineering workers are: severity and intensity of work, vibration, noise, unfavorable microclimate.

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