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THE INFLUENCE OF ENVIRONMENTAL FACTORS AND WORKING CONDITIONS ON THE DENTAL MORBIDITY OF THE POPULATION: A LITERATURE REVIEW

The aim of the given article is to present an overview of the researches dedicated to the study of the influence of environmental factors and working conditions on the dental morbidity of the population. **Results.** In Ukraine, since the late 80s of the twentieth century, there has been an increased interest in studying the impact of environmental factors and geophysical factors on the state of dental morbidity in the population, which is primarily due to objective reasons. Thus, a large number of studies over the past decades have been devoted to the effect of radiation pollution on the development of dental diseases due to the Chernobyl tragedy. Their results prove that the number of patients with gingivitis and periodontitis is significantly higher among people living in areas contaminated with radionuclides in relation to people living in clean areas of these regions. Studies of the influence of environmental factors on human health are not limited to the study of the consequences of environmental disasters. The labor of workers in certain industries is associated with especially hazardous working conditions, characterized by the complex effect of harmful production factors of various nature and intensity. Particularly hazardous working conditions under the influence of radiation and chemical production factors cause a more pronounced intensity of dental diseases, first of all, diseases of the periodontal and oral mucosa. **Conclusion.** The conducted overview proves the need to identify dental diseases in workers of different professional groups, as well as the development and implementation of appropriate therapeutic and prophylactic measures. It is also desirable to impart oral health education to the workers, to inform them of the ill effects of their working conditions and teach them some remedial measures of the oral cavity. **Key words:** dental morbidity, environmental factors, working conditions.

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ВПЛИВ ФАКТОРІВ НАВКОЛИШНЬОГО СЕРЕДОВИЩА І УМОВ РОБОТИ НА СТОМАТОЛОГІЧНУ ЗАХВОРЮВАНІСТЬ НАСЕЛЕННЯ: ОГЛЯД ЛІТЕРАТУРИ

Метою статті є огляд досліджень, присвячених вивченню впливу факторів зовнішнього середовища

та умов праці на стоматологічну захворюваність населення. **Результати.** В Україні, починаючи з кінця 80-х років ХХ століття, спостерігається підвищений інтерес до вивчення впливу факторів зовнішнього середовища та геофізичних факторів на стан стоматологічної захворюваності серед населення країни, що зумовлене насамперед об'єктивними причинами. Внаслідок цього за останні десятиліття велика кількість досліджень була присвячена впливу радіаційного забруднення на розвиток стоматологічних захворювань після Чорнобильської трагедії. Результати цих досліджень доводять, що кількість хворих на гінгівіт та пародонтоз значно вища серед людей, які проживають у районах, забруднених радіонуклідами, у порівнянні з людьми, які живуть у чистих районах регіонів країни. Дослідження впливу факторів навколишнього середовища на здоров'я людини не обмежуються вивченням наслідків екологічних катастроф. Праця робітників певних галузей пов'язана з особливо шкідливими умовами, що характеризуються комплексною дією шкідливих виробничих факторів різного характеру та інтенсивності. Особливо шкідливі умови праці під впливом різних радіаційних та хімічних виробничих факторів зумовлюють більш виражену інтенсивність зубних захворювань, насамперед захворювань слизової оболонки пародонту та ротової порожнини. **Висновок.** Проведений огляд доводить необхідність виявлення стоматологічних захворювань у працівників різних професійних груп, а також розробку та впровадження відповідних терапевтичних та профілактичних заходів. Багато бажано надавати працівникам інформацію з питань захворювань ротової порожнини, повідомляти їх про шкідливий вплив умов праці та навчати деяких заходів із відновлення нормального стану ротової порожнини.

Ключові слова: стоматологічна захворюваність, фактори зовнішнього середовища, умови праці.

Introduction. The increase in dental morbidity, which has been noted in recent years, has led to the emergence of a number of socio-economic and medical problems not only in Ukraine, but also in other countries of the world. We can agree or disagree with the authors studying the etiological factors leading to the occurrence of diseases of the tissues of the oral cavity, however, the modern period associated with environmental pollution requires a detailed study of the influence of harmful environmental factors on their development, thus underlining the relevance of the present article. One of the pressing problems that have become a growing threat in recent decades is the dependence of human health, including dental diseases, on the degree of environmental pollution, the importance of working and living conditions [1; 2; 3]. Majority of people employed in various industries are exposed to hazardous environment. This exposure deteriorates the general and oral health of people, working in industries for long hours. Every occupation is associated with one or other ill

effects on health. Studies have shown the association between occupational exposure and greater incidence of oral diseases [4].

Aim. The given article is dedicated to the overview of the researches dedicated to the study of the influence of environmental factors and working conditions on the dental morbidity of the population.

Results. At present, the prevention of any disease, including dental disease, should be carried out, first of all, taking into account geographic and ecological positions. The conditions of life on the planet are changing radically and have a strong impact on human health. One of the conditions for the emergence and development of dental diseases is a change in the quality of the environment and its effect on the human body, which is not always able to adapt to changes and the effects of the environment [5; 6]. Various factors have impact on a modern person: social, economic, industrial, urbanization, information load and increased migration, mobility of the population. From the point of view of medicine, the impact of environmental factors on the body can have various harmful consequences. As a result of the intensive use of natural resources and the growth of anthropogenic pressure on the environment, a critical ecological situation has recently developed in Ukraine, which affects human health [7; 8].

In Ukraine, since the late 80s of the twentieth century, there has been an increased interest in studying the impact of environmental factors and geophysical factors on the state of dental morbidity in the population of Ukraine, which is primarily due to objective reasons. Thus, a large number of studies over the past decades have been devoted to the effect of radiation pollution on the development of dental diseases due to the Chernobyl tragedy [9; 10]. The authors of these studies come, in particular, to such conclusions that in conditions of an increased radiation background, there is a tendency to an increase in the incidence of periodontal tissues due to a decrease in the general resistance of the organism [9]. Among the child population of Ukraine living in contaminated areas, there is also a high level of caries damage [10]. In persons exposed to ionized radiation, there is 100% damage to the periodontal tissues by generalized periodontitis, which is accompanied in most cases by the development of symptomatic catarrhal gingivitis [11]. The number of patients with gingivitis and periodontitis is significantly higher among people living in areas contaminated with radionuclides after the accident at the Chernobyl nuclear power station in relation to people living in clean areas of these regions [12].

It should be noted that studies of the influence of environmental factors on human health are not limited to the study of the consequences of environmental disasters. The development of the world and domestic economies determines the development of the industrial complex. The labor of workers in certain industries is associated with especially hazardous working conditions, characterized by the complex effect of harmful production factors of various nature and intensity. Particularly hazardous working conditions under the influence of radiation and chemical production factors cause a more pronounced intensity of dental diseases, first of all, diseases of the periodontal and oral mucosa [13].

In modern medicine, great attention is also paid to the impact of industrial production (coal, metallurgical, chemical, etc.) and the conditions of their activities on the health of workers, as well as the population living in the immediate vicinity of various industrial enterprises. Among such works there is the study of the incidence of dental caries in children with intoxication with salts of heavy metals living in regions with intensive industrial production; study of caries lesions in children in an industrial region; consideration of the influence of heavy metals on the dental status of children living in the ecologically unfavorable zones [14; 15].

As for the employees of such enterprises, in modern dentistry there is a tendency to increase interest in the study of occupational morbidity in this population group, since 2000 in Ukraine, as in other countries, there has been an intensive increase in the number of various occupational diseases [16]. For example, some researchers have found that people employed in lead production experience significant changes in their dental status: the prevalence and intensity of dental caries increases, diseases of the oral mucosa occur, gingivitis is noted, a low level of hygiene is observed, the index of gingivitis increases. In the organs, tissues of the oral cavity, qualitative and quantitative changes occur: the rate of secretion decreases, the pH of saliva shifts to the acidic side, the viscosity and the amount of sediment of the oral fluid increase; the threshold of perception of tactile, pain sensitivity decreases and the level of mobilization of temperature receptors of the gingival mucosa changes, the taste perception of the tongue changes. The chewing efficiency is significantly reduced and the optical density of the jaw bones is increased [17].

The study of the state of the oral cavity of workers in the coal mining industry [18], the dental morbidity of workers in the ammonia production [19], the incidence of caries and generalized periodontitis

in sailors [20], diseases of the oral mucosa in miners [21] are relevant today. The authors of these studies agree that human activity in difficult industrial conditions inevitably leads to the development of occupational diseases [19; 18]. The influence of chemical compounds on the human body and its tissues can manifest itself at the submolecular, molecular and cellular levels, leading to a change in metabolic processes in the tissues of the oral cavity and the body as a whole. Thus, researchers have proven the negative impact of iron ore dust, vibration, noise, temperature fluctuations on the state of various tissues of the dentition. These working conditions are considered as the main etiological factor in the development of a disease such as lichen planus [21]. In addition, it is noted that miners have a wide range of diseases of the oral mucosa and periodontal tissues. The structure, prevalence and severity of these diseases is in direct proportion to the length of service in harmful conditions [22].

The production environment of an ammonia plant also contributes to the development of dental morbidity, since the content of chemicals in the air of industrial premises, especially in workshops where finished products are stored, is several times higher than the maximum permissible standards [19]. Thus, as the researchers note, the special working conditions, together with the peculiarities of the chemical composition of the air, negatively affect the health and dental status of industrial workers [23].

Traditionally, in Odesa region, marine medicine has reached the greatest development as a branch of medical science, which studies the theory and practice of health protection in water transport. It investigates the working and living conditions of seafarers, and also provides a scientific basis for preventive measures to combat general and occupational diseases [24]. It has been proved that harmful chemicals present in the air of ship premises have a negative impact. The main sources of harmful gases, aerosols and vapors entering the ship's habitable spaces are exhaust gases, products of incomplete combustion of fuel and oils from engines and boilers. Typical is the excess of the norm of paint and varnish compositions, especially when carrying out paintwork on ships in closed and confined spaces. During the transportation of bulk cargo (grain, coal, ore, fertilizers and other mineral raw materials), a significant dust content of the air was revealed, especially on the open decks of bulk carriers, exceeding the maximum permissible norms by 10-100 times [25]. Rock dust is one of the main harmful factors when working with bulk

cargo [16]. It should be noted that in the structure of occupational diseases among workers associated with the extraction or transportation of bulk cargo in different countries, diseases of dust etiology occupy a leading place. First of all, the long-term influence of industrial dust leads to the development of dusty pathology of the lungs, since the respiratory organs are very sensitive to dust load [26]. Industrial dust is called the smallest particles of solid matter formed during the production process, which, entering the air, are suspended in it for a more or less long time. As the researchers note, when exposed to coal dust, dystrophic processes of varying severity develop in the upper respiratory tract. There is also a chronic pathology of the upper respiratory tract. Thus, the majority of workers exposed to coal dust suffer from pneumoconiosis, a dust-borne disease of the lungs [27]. In addition, it has been proved that iron ore dust containing silicon dioxide has a negative effect on the state of the oral mucosa and periodontal tissues. This leads to the development and spread of dental diseases such as gingivitis, caries, dental plaque, as well as to the weakening of the hard tissues of the teeth and their abrasion. Thus, iron ore dust has a great influence on the prevalence, intensity, frequency and nature of dental pathology [28].

Conclusions. The above facts prove the need to identify dental diseases in workers of different professional groups, as well as the development and implementation of appropriate therapeutic and prophylactic measures. It is also desirable to impart oral health education to the workers, to inform them of the ill effects of their working conditions and teach them some remedial measures.

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