EUROPEAN INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH AND MANAGEMENT STUDIES

VOLUME04 ISSUE02
DOI: https://doi.org/10.55640/eijmrms-04-02-33 Pages: 224-231

CLINIC AND DENTAL CARE FOR WORKERS IN CONTACT WITH EPOXY RESIN

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ABOUT ARTICLE

Key words: Organization of laboratory workshops, virtual instruments, laboratory workshop, models of measuring instruments, virtual laboratory stands

Received: 13.02.2024
Accepted: 18.02.2024
Published: 23.02.2024

Abstract: One of the main components in the production of building materials is silicon, and an increase in the production of building materials means an increase in the number of workers engaged in their processing. Silicon is a brown powder or gray crystals. It is a part of sandstone, graphite, sand, coal mine waste rock, molded earth and porcelain pieces. Silicon is also one of the main components of dust in many industries, especially porcelain and abrasive. Silicon dioxide is a component of quartz, quartz and other materials. Human inhalation of silicon-containing dust leads to the development of silicosis, which manifests itself in the form of pulmonary fibrosis and increasingly impairs their function.

INTRODUCTION

The combined action of silica dust and carbon monoxide leads to a faster development of experimental silicosis (M. I. Ehrman, 1960). Mixtures of molybdenum, tungsten, copper and lead accelerate and enhance the silicosis process caused by the action of silica, and iron, aluminum, magnesium, calcium and their oxides and salts weaken the effect of silicon dioxide and change the nature and rate of development of silicosis (Patty, 1958- Gross, 1960, etc.). It should be emphasized that the "age" of silica dust is also important in the development of silicosis; J. I. Abramova et al. (1961) found that dust from freshly formed rock crystals is more susceptible to silicosis than older dust. Experimental and industrial damage to the lungs by quartz dust leads to silicosis-like changes in internal organs with the formation of typical nodules in the kidneys, spleen, lymph nodes and liver. When exposed to silicon dioxide dust, changes in the mucous membrane of the upper respiratory tract were revealed (for example, R. V. Sadrieva, 1956- I. S. Sokolov et al., 1958 - N. F. Pitenko, 1963). In numerous works on silicosis, the

condition of the oral cavity when exposed to silicon and its compounds has not been studied at all. Only N. P. Pavlov (1938) and B. S. Pitenko (1938) studied the condition of the oral cavity under the influence of silicon and its compounds; S. Kozhukh (1955) gives a very brief description of the condition of the oral cavity in persons suffering from silicosis. To study the condition of the oral tissues of workers associated with glass production, we examined workers at an epoxy resin processing plant who were constantly exposed to high temperatures, carbon monoxide and silicon-containing dust. We also studied the oral health of 160 control group workers who had no contact with harmful substances. The intensity of caries and periodontal diseases differed in these two groups of workers. This suggests that occupational toxic factors in glass production contribute to the development of caries and periodontal diseases. The fact that pathological caries and enamel cracks were not detected in the control group, but were found in a significant part of the epoxy production workers (22.15% and 14.9%, respectively) suggests that the cause of their occurrence is the specific conditions of glass production. Table 20: Condition of oral cavity tissues in epoxy resin production workers

The incidence of caries among epoxy resin workers (CPUs 8 and 18) is significantly higher than in the control group (CPUs 5.41) (Table 20). According to our study of the incidence of caries in the population of Kuzbass (R. Ya. Pekker, E. D. Eisenstein et al., 1965), the KPU in various districts of the region ranges from 4.8 to 5.6. This confirms the relatively high incidence of dental caries among glass workers. The high dust content of industrial premises and the presence of dust in the oral cavity (even with the use of special dressings) affect the prevalence of caries and other dental diseases. From the point of view of the clinical picture and course, caries in epoxy production workers is not specific. Gingivitis and periodontitis were found among periodontal tissue diseases. In most cases, it was about chronic catarrhal gingivitis. The main complaint in these cases was bleeding gums. Examination of the oral cavity usually revealed increased bleeding and swelling of the mucous membrane, smoothness of the gingival edges and swelling of the gingival papillae. The teeth are covered with tartar. In the early stages of the dystrophic form of periodontal disease, the worker usually does not make any complaints. Occasionally, mostly in the morning, there was itching of the gums. No inflammatory phenomena were observed. The gum was pale, dense, and did not bleed. Gum recession was observed mainly on the lingual side near the central incisor. Radiographically, osteoporosis and changes in the interdental septa were observed in these cases. The progressive stage of periodontitis was characterized by pain in the gums throughout the entire dentition, especially when brushing teeth. Upon examination, gum atrophy and exposure of the neck of the tooth were observed. Pain was felt when the instrument was touched; horizontal bone atrophy was noted on radiographs. The distance between the teeth was evenly truncated. In the early stages of inflammatory dystrophic periodontitis, the patient complained of itchy

gums, distension of the gingival papillae, bleeding gums, an unpleasant taste in the mouth, in some cases, bad breath. The clinical picture was characterized by edema and hyperemia of the gingival papillae, especially in the anterior part of the lower jaw. Gingival papillae bleed easily when touched; osteoporosis and destruction of the compact plate are radiologically noted. Periodontal furrows are enlarged. At this advanced stage of periodontitis, a worker working with epoxy resin made typical complaints. Clinical symptoms were also characteristic of this process. The following observations are typical for periodontal diseases found in workers in the glass industry. Subject A. He has been working in the workshop for two years, a carver by profession. She has no complaints. He often suffers from catarrh of the upper respiratory tract, flu, and sore throat. The annual physical examination revealed no pathological changes in the internal organs. He does not smoke cigarettes. He does not drink alcohol. The oral cavity is in good condition.

Clinic: there are deposits of tartar. The gums are slightly hyperemic, swollen, and bleed without pain when touched. The mucous membranes of the cheeks and tongue are without features. Diagnosis: chronic simple gingivitis. Appropriate treatment has been prescribed. Gum inflammation is not observed. Minimal tartar deposition. Appropriate treatment has been carried out. Gum inflammation is not observed. Minimal tartar deposition. Subject B has been working in the workshop as an engraver for six years. He complains of slight bleeding from the gums when brushing his teeth and bad breath in the morning. The only diseases he suffered from were childhood infections and colds. He doesn't smoke. Does not drink alcohol. An annual physical examination does not reveal any abnormalities in the work of internal organs. The oral cavity is in good condition. Dental formula: the edges of the gums in the area of the teeth are swollen, hyperemic, and bleed to the touch. There are deposits of tartar on the teeth. The mucous membrane of the cheeks, tongue and palate is not changed. X-rays show interdental osteoporosis, destruction of the compact plate and expansion of the periodontal fissure.

Diagnosis: periodontitis, inflammatory dystrophy, early stage. Appropriate treatment has been prescribed. The patient was registered at the clinic. Patient B. worked for 12 years in a machine shop, a sculptor by profession. Complains of bleeding gums, discharge from periodontal pockets, gum soreness, dental disorder and bad breath. Sudden fatigue, slight excitement. He does not remember any previous illnesses. Annual medical examinations did not reveal any diseases of the internal organs. He doesn't smoke. Does not drink alcohol. Dental formula: swelling of the gingival edges, hyperemia, cyanosis, loosening and bleeding when touched. Gingival pockets up to 5 mm deep in the tooth area. When pressed, pus oozes out. Gingival pockets of varying depths in other areas of the tooth. The mobility of the teeth is from 1 to 2 degrees. Abundant deposition of tartar. X-ray images show horizontal atrophy

of the interdental spaces, expansion of the periodontal fissure and bone pockets. The structure of the bone tissue is ambiguous, with enlarged interosseous crevices. Diagnosis: periodontal disease. Inflammatory-dystrophic form. The developed stage. Appropriate treatment has been carried out. The patient was taken on dispensary registration

The analysis of periodontal diseases (gingivitis and periodontal disease) revealed a certain pattern: the largest number of cases of gingivitis is detected in workers with up to 3 years of work experience at this enterprise — 82.4%. With increasing length of service, the incidence of gingivitis decreases and in workers with more than 20 years of experience it is only 9.1%. The incidence of periodontal disease is inversely related. If workers with up to 3 years of experience have periodontal disease of 9.6%, then those with more than 20 years of experience working on epoxy resin have 81.81%. Thus, the most common diseases of the oral tissues in glass workers are periodontal diseases. A major role in the development of these diseases is given to pathological shifts occurring in the nervous and vascular systems (D. A. Entin, 1957- A. I. Evdokimov, 1962- D. Svrakov, E. Atanasova, 1962, etc. One of the local causes, the most common in this case, is tartar (Dominik, 1967). It can be found in almost 80% of people. According to A. P. Groholsky (1965), the frequency and nature of dental deposits vary depending on gender and age, on local and general factors, on the nature of nutrition, etc. The author also notes that the quality of oral care, as well as the occupational hazards of various industries, leave their mark on the nature of dental deposits. According to our data, tartar deposits were found in 92.3± 1.04% of cases in epoxy resin workers, while in the control group — only in 56.87+3.91%. Tartar in glass workers is deposited on the lingual surface of the lower central incisors and the buccal surface of the upper and partially lower large molars, i.e. in places corresponding to the excretory ducts of the salivary glands. The color of dental deposits is light yellow. Unlike the usual tartar in the observed workers, it is hard, difficult to remove and does not crumble. Deposits of tartar begin on the necks of the teeth, and later, if it is not removed, they cover the crowns of the teeth and press on the gums. The latter becomes edematous, hyperemic, and bleeds when touched. The organic composition of tartar includes microorganisms, necrotic epithelial cells, and water. The inorganic part consists of phosphoric acid and carbon dioxide salts of lime, iron phosphate, magnesium phosphate, traces of silicon oxide, potassium, sodium. Due to the fact that silicon is included in the dust of workrooms with epoxy resin, it was of some interest to study tartar for the presence of silicon. Studies of tartar were carried out in workers of glass production and in persons of the control group. The research was carried out according to the methodology of V.I. Ivanov and P. A. Rosenberg (i960). The study of tartar was carried out in 40 workers and 25 individuals from the control group. At the end of the study, it was found that in the control group,

the silicon content in tartar, depending on age, ranges from 0.24 to 0.54 mg%. For workers in the glass industry, the silicon content in tartar ranges from 2.48 to 7.24 mg.%

The results obtained during this study suggest that silicon plays a role in the formation of tartar in glass production workers. If we agree with the point of view of supporters of the formation of tartar according to the laws of colloidal chemical processes, we can assume that dust containing silicon, entering the oral cavity, is deposited on the necks of the teeth and, together with a soft plaque, is a crystallization center around which lime salts that have fallen out of saliva and new portions of silicon dust accumulate. Thus, for workers in glass production, the dustiness of industrial premises with dust containing silicon is one of the leading factors in the development of periodontopathies (gingivitis and periodontal disease) in them. As already noted, non-carious dental lesions — pathological abrasion and enamel cracks - are also common in workers of the machine shop with epoxy resin. Various groups of teeth are erasable. At the same time, on the front teeth of the upper jaw, the contact pads are located on the palatine surface, while on the front teeth of the lower jaw, such pads are expressed on the cutting edge. In small and large molars, the chewing surface is usually affected. The process of tooth erasure, as a rule, proceeds completely painlessly and in some cases reaches the gingival margin. An example of pronounced tooth abrasion is the following observation. The examined V. has been working in the machine shop for 10 years, specializing in on-board. He does not complain. He often suffers from catarrh of the upper respiratory tract, flu, and sore throat. According to the annual inspections, there are no changes on the part of internal organs. He doesn't smoke. He does not drink alcohol. The condition of the oral cavity is satisfactory. Dental formula: Pronounced deposits of tartar. The bite is orthognathic. Significantly pronounced erasability of the teeth, and the palatine surfaces are erased on the teeth, and the cutting edges are erased on the teeth. On the chewing teeth, the chewing bumps are completely erased. Diagnosis: pathological tooth abrasion. In some cases, pathological tooth abrasion can be expressed even more sharply. It can be imagined that the main cause of pathological tooth abrasion is the constant ingress of silicon dust on the teeth of workers. The enamel is erased, after which the process progresses easily.

Enamel cracks in glass production workers occur on the crowns of the frontal group of teeth, usually localized on the enamel along the axis of the tooth from the labial side or located in the corners of the tooth crown. Cracks located in the corners of the tooth crown gradually lead to the separation of part of the crown (Fig. 30). It should be noted that when cracks in the enamel of teeth occur, workers usually do not complain. Chipped teeth cause discomfort due to chronic injury to the lip or tongue. To illustrate what has been said, we present an extract from the medical history. Subject X. He has been working in

the machine shop for 8 years, specializing in smelter. He does not complain. He often suffers from colds. According to the annual inspections, there are no changes on the part of internal organs. Smokes. He drinks alcohol moderately.

Clinic: Deposits of tartar are noted. The bite is orthognathic. The gingival margin is of normal color, dense, does not bleed. Gum atrophy is pronounced in the area of the frontal teeth. The necks of the teeth are exposed. When touching the probe in the neck area of these teeth, soreness is noted. There are splinters on the teeth in the area of the angle. The X—ray shows osteoporosis of the interdental septa, destruction of the compact plate of the interdental septa. The diagnosis is periodontal disease. The dystrophic form. The initial stage. Chipping away at the teeth. At workplaces in the machine shop, especially where smelters, on-board workers and workers of other specialties work, the temperature is very high — 45-55 ° C. At the same time, cold water is supplied to the drinking fountains installed in the workshop.

CONCLUSION

Workers often drink water. Sudden temperature changes cause cracks to appear first, and then teeth to break off.

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