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## NON-CARIOUS DENTAL LESIONS IN PEOPLE OF DIFFERENT AGE GROUPS

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**Annotation.** This article is devoted to a comprehensive study of such an urgent problem as non-cariou dental lesions. Special attention is paid to diseases such as wedge-shaped defect, erosion of hard tooth tissues and fluorosis. The purpose of the article is to analyze the statistics of the occurrence of this group of diseases, the peculiarities of the frequency of manifestation in different age groups of people, as well as to identify causal factors and the degree of their impact. The work was carried out by collecting data obtained on the basis of a population survey, for which a pre-prepared questionnaire was used. After collecting the necessary information and obtaining data from different age groups of people, the results of the survey were tested and analyzed, on the basis of which it is possible to judge the prevalence of non-cariou dental lesions. The article also highlights and describes the characteristic features of a wedge-shaped defect, erosion of hard tooth tissues and fluorosis, examines their causes, clinical manifestations, pathogenesis, at the same time, attention is paid to preventive measures and methods of treatment of each disease separately. In conclusion, the article summarizes the results and conclusions about the frequency of occurrence of each non-cariou tooth lesion in people of different age groups.

**Keywords:** non-cariou dental lesions, wedge-shaped defect, erosion of hard tooth tissues, fluorosis, occurrence statistics

Currently, the most common dental disease is caries, the prevention and treatment of which people are familiar with, but what about other diseases? Non-cariou dental lesions are diseases in which damage to the hard tissues of the teeth is not associated with caries. The main signs of such diseases are the destruction of enamel and dentin, impaired chewing functionality and aesthetic defects. Currently, this group of diseases continues to be studied, numerous studies are underway, including those related to the diagnosis, treatment and prevention of non-cariou dental lesions. Such diseases include a wedge-shaped defect, erosion of hard tooth tissues and fluorosis:

A wedge-shaped defect is the destruction of the hard tissues of the tooth in the neck area, as a result of which the tooth takes the shape of a wedge. The most common cause of this ailment is improper or substandard oral hygiene.

Erosion of hard tooth tissues is a lesion of hard tooth tissues, a progressive defect accompanied by destruction and loss of enamel and dentin.

Fluorosis is a disease that affects the enamel and is associated with the ingestion of excessive amounts of fluoride. These diseases are characterized by different frequency of occurrence in people of different age groups. In addition, individual characteristics of the body can have an impact: lifestyle, the presence of concomitant diseases and the quality of oral hygiene.

Research objectives:

1. Development of methods for the prevention of non-cariou diseases of the oral cavity
2. Setting the cause of these diseases
3. Review of statistical data among groups of different ages
4. Dissemination of information on the prevention and treatment of diseases among the population
5. Identification of groups susceptible to diseases

### Materials and methods of research

To conduct the study, we prepared an anonymous questionnaire with questions on the topic "Non-cariou dental lesions" in order to conduct a survey among people of different age categories and analyze the results for further research.

In accordance with the tasks set, when compiling the questionnaire, in addition to the gender and age of people, we took into account the presence of a wedge-shaped defect, erosion of hard tooth tissues or fluorosis, as well as factors that could provoke the development of these diseases, such as: poor or improper oral hygiene, lifestyle and diet, the presence of concomitant diseases.

165 people took part in the survey, whose ages ranged from 14 to 65 years old. Statistical data processing was carried out, with the help of which age groups were identified and delimited, among which such non-cariou lesions as a wedge-shaped defect, erosion of hard tooth tissues and fluorosis were most common.

### Results of the research and discussions

165 people took part in the survey, including 119 women and 46 men. After analyzing the data, we were able to draw the following conclusions:

Of the 165 people who participated in the survey, 72.1% were women and 27.9% were men.

As a result of the survey, we found out that a wedge-shaped defect occurred in 8.5% of the respondents and was formed in them mainly at the age of 20 to 35 years. Clinically, it manifests itself as a V-shaped cavity in the cervical region of the tooth, in most cases it is not accompanied by painful sensations, the defect forms slowly, but the tooth cavity does not open and does not soften. The causes of the wedge-shaped defect have not been fully established, but it is believed that mechanical and chemical factors have an effect. Such factors include a hard toothbrush, acid-containing products or forming acids from accumulated food residues, low intake of calcium and phosphorus into the body as a result of their insufficient content in food, as well as the presence of endocrine diseases. A wedge-shaped defect is a pathology for which the mechanism of occurrence has not yet been definitely established [1]. Numerous sources offer various theories explaining this condition.

One of the theories, called mechanical, suggests that the defect is associated with mechanical action on the neck of the tooth. The area of the neck of the tooth is the most fragile, so the enamel in this area is eroded faster. This can happen, for example, with improper brushing techniques, strong pressure with a toothbrush, or the use of aggressive toothpaste containing large particles. An interesting fact is that left-handed people have a wedge-shaped defect more often on the left, and right-handed people have it on the right. However, there is no direct scientific evidence of this fact.

The second theory, known as the erosion theory, suggests that V-shaped defects occur due to the weakening of enamel under the influence of food acids. Acids cause calcium deficiency and disrupt the mineral balance. This happens when, after oral hygiene, a person consumes aggressive foods such as citrus fruits, hard apples or carbonated water.

The third theory, occlusive, states that the cause of the wedge-shaped defect is malocclusion. Improper placement of teeth and improper closing of the jaws lead to an uneven distribution of force during chewing on each tooth. This theory is confirmed by the fact that wedge-shaped defects occur more often

on teeth that are most stressed during chewing. Other factors can lead to the development of such a pathology, such as severe clenching of teeth at night, the presence of pathologies of the nervous system or a contraction of the chewing muscles.

Visceral theory suggests that systemic disorders, such as diseases of the gastrointestinal tract, endocrine or nervous system, can cause the development of wedge-shaped defects.

Periodontal theory suggests that the cause is related to infectious diseases of the parotid tissues, such as periodontitis or periodontal disease. The clinical signs of these pathologies include the exposure of the roots of the teeth and the formation of specific "triangles". The subsequent erosion of teeth is caused by the action of acids and microorganisms that form plaque, which leads to further destruction of hard tissues [2].

The wedge-shaped defect has different classifications, one of them was proposed by A.S.Burlutsky in 1984, he distinguished such types:

1. Cervical defects, located on the cement-enamel border, slowly develop in the direction of the pulp chamber, maintain shape constancy
2. Crown defects, located on the vestibular surface of the tooth, develop rapidly, damage the surface layers of the tooth
3. Root defects, located at the cement-enamel border, develop rapidly, spread over the surface of the root, always accompanied by frontal gum atrophy [3].

There is also a more modern classification of the wedge-shaped defect, proposed by L.V.Musina in 2006:

- A – prishechny; – In – the – root; – C – crown; – D – neck-crown; – E is a combined form.

Thus, the pathogenesis of a wedge-shaped defect can be caused by various factors, including mechanical stress, erosion, malocclusion, systemic disorders and infectious diseases. Further research is required to more accurately determine the causes and mechanisms of this pathology. The interviewees who had a wedge-shaped defect noted the quality of their oral hygiene as "satisfactory", frequent lack of balanced nutrition, high content of carbohydrate-containing and acid-containing foods in food, the presence of weak tooth sensitivity and thyroid dysfunction – all these listed reasons contribute to the development of this defect. As a treatment, people with teeth affected by a wedge-shaped defect are prescribed drugs containing calcium, phosphorus and necessary trace elements and vitamins, and in case

of deep defects, they resort to restoration with filling materials [4].

Erosion of the hard tissues of the tooth was in 25.5% of the respondents, most often occurs between the ages of 30 and 40 years, but can also occur in people aged 15 to 20 years. Consequently, every 4 middle-aged people faced this problem. This defect is associated with the destruction of enamel and dentin. It is most common in middle-aged and elderly people, but there are exceptions. The lesion in most cases affects incisors, canines and premolars, having a symmetrical character. Erosion of the hard tissues of the tooth occurs gradually, affecting the surface and subsurface layers of enamel. Demineralization, usually caused by contact with acids, leads to the loss of inorganic components of the enamel, especially calcium salts, which reduces its strength. The structure of the enamel changes, with hydroxyapatite crystals providing the strength of the enamel, becoming large and with blurred contours. When examining the affected incisors, this is clearly visible on the scans. Dentin also becomes heterogeneous, with some tubules closed. The structure of dentin becomes similar to that of increased tooth abrasion, with a decrease in the size of dentine tubules and excessive mineralization. In the area of the cervical part of the tooth, a clear boundary remains, where the enamel is layered on the cement of the root. Progressive erosion first erases the surface of the enamel, then affects the deeper layers, hardens the dentin, and in the later stages involves the pulp. If the cause is not eliminated and the defect is not corrected, the process will continue and eventually lead to tooth loss [5]. The formation of erosion is not only a cosmetic defect, but also a serious dental problem, therefore it needs immediate treatment. In the early stages, this disease can be recognized by the lack of gloss on the enamel, later in the active and middle phase hyperesthesia may appear during hygienic measures and exposure to chemical and thermal substances. Erosion is diagnosed during a dental examination by a doctor. Treatment of dental erosion includes comprehensive remineralizing therapy (oral administration of calcium, phosphorus, vitamin and mineral complexes; local applications, electrophoresis), if necessary, filling of defects or coating of teeth with crowns. The prevention of this disease includes several aspects: the selection of the right oral hygiene products, the exclusion or reduction to a minimum of food intake with high erosion potential and the treatment of concomitant disorders of the endocrine system.

It was found that only 5.5% of the survey participants had such a non-carious lesion as fluorosis. According to the results of the survey, we were able to find out that the average age of such a defect is 4 years. Fluorosis is a disease in which the tooth enamel is affected. The main reason for the occurrence of such a lesion is the ingestion of high levels of fluoride into the human body. The lesion manifests itself initially in the form of whitish spots on the surface of the tooth, and later: yellow pigment appears, erosion and destruction of enamel. The pathogenesis of fluorosis is not fully known. There are several hypotheses:

- improper enamel formation occurs when fluoride has a toxic effect on the ameloblasts;
- fluoride, when ingested for a long time, reduces the activity of phosphatase, simultaneously disrupting the mineralization of enamel;

Fluorosis occurs when fluoride is consumed with other elements (such as potassium, manganese, magnesium, etc.), which leads to demineralization of hard dental tissues. Fluorosis most often occurs due to the consumption of water and foods with elevated levels of fluoride (sea fish, walnuts, tea).

According to WHO, fluorosis has the following classification:

1. Very light – normal enamel color, almost unchanged.
2. light – enamel in the form of small spots and white stripes, occupying less than 25% of the crown area.
3. moderate – pigmented stripes and spots occupy no more than 50% of the area.
4. moderate severity – yellow or brown tooth crowns. The enamel becomes matte, there are specks on the entire crown.
5. heavy – the enamel is partially destroyed, pits and erosions appear.

There are also various forms of fluorosis according to V.K. Patrikeev:

- Stroke shape – the appearance of strokes – subsurface chalk-like strips of enamel. It is more common on the vestibular surface of the incisors of the upper jaw. Corresponds to mild fluorosis (WHO).

- Spotted form – multiple chalky spots without stripes. The enamel in the spot area is smooth and shiny. It corresponds to a moderate degree of fluorosis.

- Chalky-speckled shape – the enamel of the entire tooth is a matte shade with clear pigmented speckled spots. The bottom of such specks is dirty gray/brown. It corresponds to a moderate degree of fluorosis.

- Erosive form – pronounced pigmentation with erosion. Deep defects are possible.

The enamel is quickly eroded, and the dentin is subsequently exposed. Corresponds to a severe degree of fluorosis.

- Destructive form – a violation of the crown shape due to erosion and abrasion. The teeth are more fragile, and a part of the crown may be broken off.

As a preventive measure for this lesion, it is recommended to stop taking such drinking water. The treatment is aimed at restoring the aesthetic and mineral properties of the teeth.

It is shown that in all the diseases considered by us, 57% of the respondents are not familiar with the measures of prevention of non-cariou diseases at all or are only partially familiar. This suggests that with an increase in the number of people who know about prevention methods, many would be able to avoid these diseases or reduce their degree of manifestation.

### Conclusions

From a survey of 165 people, we found that 119 participants were women and 46 were men, but these pathologies were more common in men. In addition, we found that a wedge-shaped defect was observed in 8.5% of the respondents, and this defect occurred more often between the ages of 20 and 35 years.

As for the erosion of the hard tissues of the tooth, it was observed in 25.5% of the respondents, mainly aged 16 to 40 years. Thus, one in four middle-aged people faced this problem.

Only 5.5% of the survey participants had a non-cariou lesion – fluorosis. From the results of the survey, we learned that the average age at which this defect manifests itself is 4 years old.

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