

ORAL MANIFESTATIONS IN HEART DISEASES IN CHILDREN IN THE CONTEXT OF THE PANDEMIC GENERATED BY COVID-19

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ABSTRACT

Oral health condition may be a good predictor of cardiovascular health. The mouth is full of bacteria, both good and evil, and the "bad" can enter the bloodstream and cause inflammation of the blood vessels, leading to cardiovascular diseases. Studies have shown that tooth loss and inflamed gums (periodontitis) are markers of heart disease. Another indicator is the color of the lips. Lips are usually red, but may be bluish (cyanosis) in people with heart problems due to system failure and cardiovascular to supply oxygenated blood to tissues; blue lips are probably only caused by a temporary lack of oxygen and pass quite quickly. Heart disease is complex and difficult when it affects adults, but in children the impact is much greater. There are many types of heart disease that can affect children. These include congenital heart defects, viral infections and even heart disease acquired due to other genetic conditions. In some cases the symptoms are not obvious and its delays in diagnosis. At other times, the symptoms are very clear and require medical consultation. COVID-19 virus _

Keywords: heart disease, COVID-19 virus, viral infections, oral syndrome, dental conditions.

INTRODUCTION

When a child is diagnosed with a certain type of cardiomyopathy, the heart is not able to pump blood efficiently. Symptoms may include difficulty in breathing, heart rhythm abnormalities, dizziness, or swelling of the hands and feet[1-6].

There are many types of heart disease that can affect children. These

include congenital heart defects, viral infections and even heart disease acquired due to other genetic conditions. _

The interdependence of the conditions and stomatological and internal diseases due to increasingly paying attention. Considerable spreading of caries frequency of periodontal pathology, oral mucosa and tongue shows that we must look not so much because of local changes both, especially, in the general changes of the

body, which contribute to their appearance[7-10].

The great influence of the pathology of the maxillo-dental apparatus and other diseases of the oral cavity on the genesis and evolution of many general sufferings of the organism is indisputable.

Because some oro-dental manifestations may represent either the onset or the evolutionary stage or even provide data for the prognosis of a disease, we will investigate these manifestations in some cardiovascular diseases, in hospitalized children.

The patients explored suffered from: congestive heart failure; some valvular diseases; ischemic heart disease, bacterial endocarditis; hypertension[11-16].

Cardiac failure → generally it is characterized by clinical manifestations of a global heart failure, oral congenital. Cardiac failure have symptoms evolving with purple cyanosis. The patient with chronic pulmonary heart has a cyanotic face, slightly edematous eyelids, resembling a tired child. The oral mucosa is pink-cyanotic, especially during periods of decompensation, and the labial mucosa is blue-purple.

Hipoxia in the oral cavity causes the development of the spindle-spiral microbial flora, especially in the dental alveolus (alveolar pyorrhea). There are also ulcers of the gums. The oral mucosa has small canker sores or blisters for the same reason. Lingual mucosa is slightly moistened, and the tongue is aloin with a yellowish-white deposit is red papillae murder. The tongue can be met with a white or leucoplazic mucosa. The teeth fall, have low resistance and are prematurely mobile, due to periodontitis that gradually sets in during heart failure. Periodontopathy is due to circulatory stasis from heart failure. We also encounter salivary disorders: hyposalia, asia, xerostomia and gray gingival lysate.

Some **valvulopathies** (aortic insufficiency, mitral stenosis) evolve, in addition to the general symptoms that outline the clinical picture, with oral manifestations. By examination of the oral cavity was observed cyanotic gum staining, edema of the gums, alveolar pyorrhea. The Xrays show atrophic changes of bone tissue.

The correlation between tonsillitis, dental foci and valvular lesions of rheumatic origin has long been established and should no longer be questioned. In acute rheumatoid arthritis as well as in bacterial endocarditis, much less attention is paid to the outbreaks of infection in the decayed teeth, to the pathological dento-gingival pockets in periodontitis, and in the normal ones of healthy children.

As oral manifestations we will meet the gray-white labio-oral mucosa with very obvious capillary pulse, especially on the inner face of the lower lip. Cyanosis of the labial and vestibular mucosa is almost constantly encountered in mitral stenosis. 1-mitral valve area $1/2 \text{ cm}^2$ or less. The growing venous pressure and pulmonary capillary wedge further accentuates the cyanosis is observed from the oral mucosa, oral cavity jugular and sublingual. Some salivary disorders: hiposalia, xerostomia, which favors the installation of multiple foci of infection and changes in the periodontium and teeth. Caries, chronic marginal periodontitis, are more common. In the gingival mucosa there is intense cyanosis and gingival papillae are edematous bones[17-23].

Ischemic heart pain, characterize the clinical picture of ischemic heart disease; the following oral manifestations are found: glossodynia, mandibular pain, gingival-cardiac or cardio-gingival pain, salivary disorders.

The salivary disorders encountered are: hyposalivation, xerostomia. The pale color of the extremities, especially of the

cephalic extremity, is the result of the same anxious state with a higher concentration of reduced hemoglobin (over 5-6%). Sometimes, irradiation of pain in the jaw, gums or tongue (glossodynia) can be confused with their own pain. At other times, hiccups and even vomiting are added to it. We find these clinical manifestations more frequently in the supine position.

Along with the improvement of the general condition and blood circulation, both the macroscopic appearance of the tongue and the general background of the capillary picture are gradually restored. In cases with stenocardial crises or repeated myocardial infarction, pathological changes of the tongue reappear.

Endocarditis: the most common pathogen is streptococcus viridans, followed by enterococci. The tongue is sabural due to the abnormal elongation of the lingual, whitish, corneal papillae due to insufficient mastication, especially when the general condition is altered.

It is known that the bacteremic condition occurs in over 50% of cases with dental interventions on dental septic foci. These can sometimes be followed by endocarditis. The oro-dental infectious source remains important in the etiopathogenesis of subacute endocarditis.

Most dento-periodontal interventions are accompanied by bacteremia, but the highest percentage is given by dental extractions. For the healthy persons, the interventions are harmless, but they can trigger in patients with congenital heart disease or acquired the appearance of very serious complications. Viridans streptococci, anaerobes, etc. can be found. The use of adrenaline anesthesia increases the percentage of anaerobes given by vasoconstriction, which reduces oxygenation[24-28].

Atherosclerosis is manifested in the oral cavity by osteoporosis, to which is added

the resorption of dental alveolar processes and changes in the temporomandibular joint. In the oral mucosa, the epithelium thins, keratinizes, the salivary glands atrophy, which leads to decreased salivary secretion, which becomes increasingly viscous, by increasing the percentage of mucin. Decreased salivary secretion is a major cause of aggravation of cariogenic factors. Local factors, such as dental joint disorders and decreased oro-dental hygiene, play a predominant role. Tooth mobility evolves slowly. The dental pulp changes its structure because the vessels and nerve fibers are poorly irrigated by progressive obliteration of the apical phenomenon. Decreased vascularity and pulpal fibro-calcareous degeneration decrease pulpal resistance to subsequent aggressions.

Any pulpal irritation causes the formation of an amorphous tertiary dentin. It is an abnormal, pathological dentin, most commonly tolerated without clinical signs. Dentin progressively becomes the site of a sclerotic degeneration, its hypercalcification having as a consequence the retraction of the dental tubes.

The enamel thins out by wear. The abrasion occurs on the occlusal faces. Sometimes we encounter a double abrasion by the disappearance of the relief of the occlusal face[29-32].

Atherosclerosis is a disease characterized by accumulation of plaques of fats and cholesterol in the arteries. With increasing these substances become stiff and narrow arteries, increasing the risk as the clots in tongue area.

It usually takes many years for atherosclerosis to occur and it is unusual for adolescents and children to suffer from this disease. However, obesity, diabetes, high blood pressure and other diseases put children at risk.

Doctors recommend frequent evaluation of children to determine their

cholesterol levels. Also, blood pressure should be monitored frequently, especially if in the family there is a history of heart disease, diabetes or obesity.

Treatment usually involves lifestyle changes, such as the introduction of exercise and dietary changes. Thus, children must give it up to chips and sweets.

Complicated hypertension - Increased blood pressure with subjective symptoms and objective forms a syndrome that can be found in numerous diseases, is produced from different mechanisms → hypertension complicated by reducing artery wall elasticity and great vessels. This example is to be found in atherosclerosis (high elasticity), hypertension complicated by increasing arterial resistance in the arteries. Hypertension alone evolve in three stages, as manifested by headache, palpitations, chest needles, dyspnea, angina pectoris, dizziness, vertigo, visual disturbances. As a consequence of the long-term increase in blood pressure occurs arterio sclerosis which actually affects the whole body, and the clinical manifestations result mainly from the locations on the coronary, cerebral and renal arteries. Labial mucosa complicated is pink, slightly cyanotic because beyond normal concentration of hemoglobin is reduced. Papillae hyperemia teeth are stained, pink and jugal swollen. Mucosa is reddish. Lingual mucosa is slightly with buds present[33-35].

The lateral tooth show edentulous arches terminal due to chronic periodontal disease. The frequency and severity of periodontal lesion are directly proportional to the stage of the hypertensive disease. Patients suffer from high blood pressure and dental headache.

Migraine headaches are common symptoms of multiple disorders whose etiology reveals vascular, digestive, osteoarthritis ophthalmic, ENT, headache

etc. The origin is not easily detectable by clinical and conventional analgesics do not calm the pain. Studies shown in most of the headaches are accompanied by dental symptoms, and x-ray of the jaws can sometimes guide us on the diagnosis. Dental treatment in some cases has led to the permanent disappearance of painful symptoms, which is an argument in favor of the dental etiology of headaches[36].

Dental headache is medically confusing in terms of topography, the pain radiates to the temporal, occipital, frontal and molar regions, and there may be pain in the pharynx. They are very lively, irregular, exacerbated by cold or chewing.

The diagnosis of these diseases is based on numerous aspects, starting from the clinical picture, to extensive investigations, such as: fetal echocardiography; and cocardiogram; and electrocardiogram; chest radiograph; pulsoximetry; cardiac catheterization, and Magistère magnetic resonance complicated.

Viruses, in addition to causing respiratory illnesses such as colds or the flu, can also affect heart health. Infection laid virus can cause myocarditis, i.e. muscle infection truancy heart. Following this disorder offenses heart's ability to pump blood to the body is reduced.

Infect laid viral heart are rare and can cause flu-like symptoms, including fatigue, dyspnea and chest discomfort. The treatment is medicinal and aims to reduce symptoms.

Covid-19 can cause serious cardiovascular complications, from heart failure, heart attacks to stroke, draw the attention of several emergency physicians, who say that so far the focus has been on lung complications of Covid-19, but less has been said about cardiovascular complications.

Children are not more susceptible to infection with the new coronavirus (COVID-19), compared to the general population,

according to existing data; most of the reported confirmed cases of COVID-19 occurred in adults. Infections have also been reported in children, including very young children[37].

Even though they seem to be the least affected in terms of infection with the new coronavirus, SARS-CoV-2 can endanger those suffering from a number of conditions, and their immunity is very low. The virus that causes COVID-19 is mainly transmitted through respiratory droplets, which are spread when an infected person coughs, sneezes or exhales. These drops are too heavy to stay in the air, so they settle on objects or surfaces. Symptoms of COVID-19 are common flu, manifested in children and adults with fever (over 38 degrees), dry cough sore throat, general weakness and fatigue, muscle pain. In the most severe cases, it occurs pneumonia and acute respiratory infection. At the same time, there are asymptomatic cases. The transmission of COVID-19 virus depends on many factors, the most obvious being the physical distance. It is now known that a person with COVID-19 can transmit the virus before they have symptoms (they are asymptomatic).

The virus is the simplest form of cell life. Viruses are not considered living beings, but they still have genetic material, being at the intersection of living and non-

living. Unlike other life forms, they do not consume food and do not produce energy.

The most common symptoms of COVID-19 are fever, dry cough and fatigue. Other symptoms that are uncommon and may occur in some people are: pain, nasal congestion,

COVID-19 and the flu are respiratory infections, in which there are important differences between the viruses that cause them and how they spread. These characteristics are important for public health measures that can be implemented to control the spread of these diseases. Respiratory infections, such as the new coronavirus infection, can trigger asthma symptoms[38].

Oral manifestations in some heart diseases are of two kinds: events common to cardiac disease is, cyanosis, such as the lips and mucous membranes of the oral cavity, the exacerbation of many of the microbial flora in the presence of infected teeth, etc; manifestations specific to heart disease (Muller triad, glossodynia, chronic superficial marginal periodontitis, etc.)

Some oral manifestations may indicate the gravity of a vascular disease.

MATERIAL AND METHOD

The study includes a number of 19 patients between January 1, 2019-1 Jan.2020 aged between 11-18 years, diagnosed with heart disease in children. Of the 19 cases 11 are girls, and 8 are boys (Fig.1).

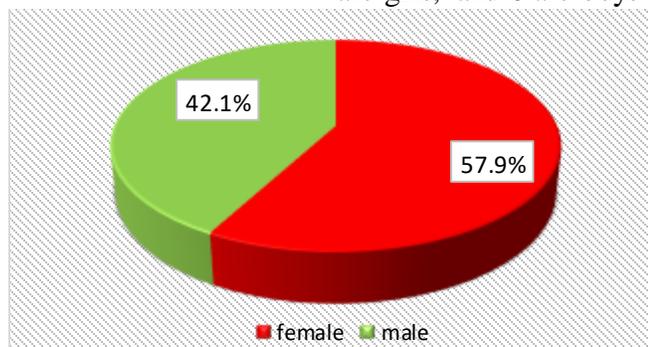


Fig.1 Distribution of patients by gender

RESULTS AND DISCUSSIONS

The complete treatment of a cardiac disease is carried out both of the internist and the dentist (bacterial endocarditis, endocarditis reumatică).

There is a common pathogenesis of oral dental

and cardiovascular manifestations (hypertension, myocardial infarction, etc.).

The evolution and prognosis of a cardiovascular disease can be appreciated even after the presence or disappearance of the oro-dental manifestations (Fig. 2).

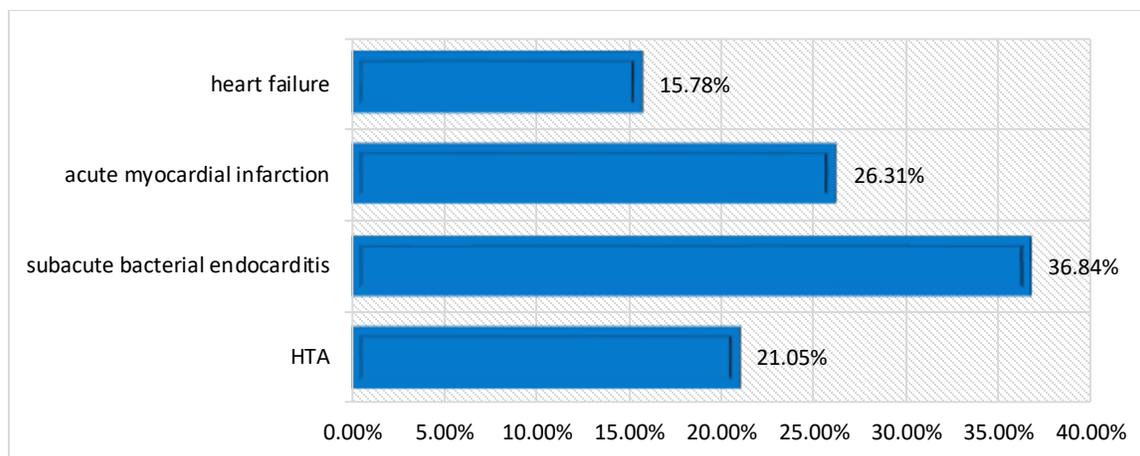


Fig.2 Distribution of patients according to the type of cardiovascular pathology

From the cases 21.05% were diagnosed with hypertension: blood pressure over 160 / 100mmHg, headache, dyspnea, vertigo, tinnitus, dizziness disorders, precordialgies.

Oral manifestations show pink-cyanotic labial mucosa and bright pink jugular mucosa, hyperemic, congested interdental papillae; chronic marginal periodontitis with periodontitis, dental tartar, pain in the temporo-mandibular joint, disorders of salivary secretion; edema of the gingival papillae, 36.84% with the diagnosis of subacute bacterial endocarditis. General manifestations, including cardiac: pre-existing valvulopathy; prolonged fever; hepatosplenomegaly-renal touch, systolic-diastolic murmur at the mitral focus, the presence of viridian streptococcus, the color of

the facial skin, light but anotic sabotaged tongue; policemen with some septic outbreaks, 26.31% with the diagnosis of acute myocardial infarction-obesity.

General and cardiac manifestations present atrocious pain in the precordial region; anxiety; reduction of pain until disappearance after administration of analgesics, opiates; decrease in blood pressure prone to cardiogenic collapse, ECG changes of necrosis-myocardial injury.

Oral manifestations show irradiated pain (lying down) in the tongue, jaw; gum; salivary disorders-xerostomia, cyanosis of the cephalic extremity; pseudomembranes on the lingual mucosa of red-cyanotic color, 15.78% with the diagnosis of heart failure, chronic ischemic heart disease, atrial fibrillation.

General and cardiac manifestations present rest-orthopnea dyspnea, pink-cyanotic edema in the lower limbs; hepatomegaly; cardiomegaly; jugular turgor ; heart rhythm disorders, atrial fibrillation (AV = 124 / min); pulse deficit (102 / min).

Oral manifestations show pink-cyanotic oral mucosa, blue-purple labial mucosa; alveolar pyorrhea, ulcers of the gums, lingual sabural mucosa with creamy white-yellow deposit and leukoplakia, high volume lips, chronic marginal periodontitis.

CONCLUSIONS

Cardiovascular diseases include diseases of **the blood vessels** or affecting the structure or function **of the heart**, some genetic, but many that are the result of lifestyle.

Atherosclerosis is a disease that occurs when platelet deposits form on the arterial walls. These deposits thicken the arteries, leading to their stiffening and affecting blood flow.

Heart failure, sometimes called congestive heart failure means the heart no longer pumps blood efficiently. The heart continues to function, but below the body's need for blood and oxygen, which is unfulfilled.

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