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Diagnosis and Treatment of Dental Changes in Patients with Arterial Hypertension of the Parodontitis

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Abstract In this article, effective methods of early diagnosis and treatment of the dental condition of patients with arterial hypertension and pathological changes in the organs of the oral cavity are presented. One of the most important factors in the pathogenesis of hypertension is a violation in the microcirculatory system, which is the basis for inflammatory and destructive diseases of periodontal tissues and oral mucosa. Changes in the microcirculatory system progress with the development of the disease and closely correlate not only with the severity of arterial hypertension, but also with the degree of circulatory disorders in the parodontium.

Keywords Arterial hypertension, Dental condition, Pathological changes in the organs of the oral cavity, Early diagnosis and treatment

1. Introduction

The significant prevalence of arterial hypertension and the frequency of its complications determine the relevance of research on the active detection, treatment and prevention of the disease at the population level. Along with an increase in the frequency of detection of cardiovascular diseases, the incidence and mortality of young people of working age have increased significantly, thereby increasing the importance of early diagnosis of hypertension, which makes it possible to have an effective effect before irreversible organic changes occur in the target organs. Diseases of the oral mucosa and pathological processes in periodontal tissues in arterial hypertension are explained by the pathogenetic community of these processes. Great importance in the occurrence and development of hypertension, generalized periodontitis and periodontal disease is attached to increased activation of the sympathetic division of the autonomic nervous system, which leads to dysfunction of the centers regulating vascular tone and blood pressure, microcirculatory disorders, increased vascular permeability, including in periodontal tissues. It should also be taken into account that in patients with chronic generalized periodontitis and periodontal disease combined with arterial hypertension, hypoxia contributes to an increase in the excitability of the sympatho-adrenal system, swelling of the endothelium of arterial vessels, deterioration of redox processes in periodontal tissues, and a decrease in the adaptive capabilities of the microcirculatory bed and connective tissue [1,3,5,7,9,11, 13,15,17].

At the same time, there is no clear understanding of the features of changes in the oral mucosa and periodontal tissues in the initial and later stages of hypertension, that is, during the formation and stabilization of arterial hypertension, which led to the study of this problem and the development of prognostic criteria in the dental care system. The clinical features of the oral mucosa were revealed, characterized mainly by vascular (hyperemia, edema, cyanosis, telangiectasia, dilated sublingual veins, vascular-vesicular syndrome, cyanosis of the lips), proliferative (hyperplasia of the mushroom and leaf papillae) and atrophic changes (atrophy of the filamentous papillae). For the first time, the features of the clinical, functional and radiological state of periodontal tissues in patients with hypertension in Tajikistan have been studied and the characteristics of the relationship between the clinical parameters of periodontal diseases and the main indicators of regional hemodynamics are presented. A detailed description of various clinical manifestations of changes in the oral mucosa in hypertensive disease has been carried out. Changes in clinical and functional parameters in hypertensive crises were revealed. Based on clinical and functional indicators, changes in the oral mucosa and periodontal tissues were revealed depending on the etiological factor and severity of the pathological process in hypertension. The results of the study are implemented by dentists in order to select pathogenetic therapy and a set of preventive measures for dental diseases. Diseases of the circulatory system remain the most significant diseases and are one of the most pressing health problems.

Arterial hypertension (AH) remains one of the determining risk factors in the development of severe cardiovascular

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pathology, affecting the state of health, duration and quality of life, disabling a significant part of the population, more often people with extensive professional experience and potential for active life. 15-20% of the adult population of most economically developed countries suffer from various forms of arterial hypertension. Hypertension that exists for a long time leads, as a rule, to irreversible changes in the target organs (brain, heart, kidneys, retinas) of the human body and is the main cause of disability and premature death.

This means that a significant part of the population is constantly exposed to both the adverse effects of hypertension itself and a high risk of complications known for their severe consequences, such as cerebral hemorrhage, circulatory failure, coronary heart disease (CHD), myocardial infarction, arterial vascular thrombosis, nephrosclerosis, and sudden death. All cases of hypertension are divided into primary and secondary (symptomatic), which in the population account for 90-95% and 5-10%, respectively. The consequences of hypertension cause such great damage to society that the problem of studying etiopathogenetic mechanisms is put in a number of important tasks that have not only medical but also social significance. In the early 90s, the criteria for AH were revised towards stricter ones. According to modern concepts, arterial hypertension is a persistent increase in blood pressure: SAD above 140 mmHg and DBP above 90 mmHg. According to WHO recommendations, figures below 140/90 mmHg are accepted as a normal blood pressure level, the borderline range is 140/90-160/95, blood pressure 160/95 and higher at rest is regarded as hypertension. The optimal blood pressure level in terms of the risk of developing cardiovascular diseases was established only after the completion of several long-term studies involving large populations. The study involved 356,222 men aged 35 to 57 years without a history of myocardial infarction. Analysis of the data obtained showed that the 6-year risk of fatal coronary heart disease is lowest among men with baseline DBP below 75 mmHg and SAD below 115 mmHg. Mortality from coronary heart disease is increased at levels of DBP from 80 to 89 mmHg and SAD from 115 to 139 mmHg., which are conventionally considered normal. Thus, with an initial DBP of 85-89 mmHg, the risk of developing fatal coronary artery disease is 56% higher than in people with DBP below 75 mmHg. With an initial SBP of 135-139mmhg. the probability of death from coronary heart disease is 89% higher than in people with SAD below 115 mmhg. Therefore, it is not surprising if the criteria for diagnosing hypertension are further tightened in the future. The most important feature of the course of hypertension is the occurrence of hypertensive crises (HA), a frequent and dangerous complication of hypertension. A hypertensive crisis can occur with hypertension of any origin. The basis for the development of HC is considered to be the failure of the protective and adaptive functions and adaptive capabilities of the central nervous system, which causes outbreaks of arousal and decompensation of the mechanisms regulating the constancy of the action of the cardiovascular system. In addition to the hereditary predisposition to hypertension, it is necessary to take into account such facts as different climatic and social conditions, an increased pace of life for some and natural conditions for others, as well as the nature of nutrition. Literature data indicate that GB is much less common among mountain dwellers and is less severe. It is very interesting and important to explain the mechanism of the tendency to hypotension in residents of different mountainous regions. Thus, M.M. Mirrakhimov (1971-1976) concludes that the effects of dry mountain climate and high ultraviolet radiation, as well as the state of arterial vascular tone, are of great importance in the genesis of hypotension.

The observed decrease in systemic blood pressure is associated with the reflex unloading of a large circulatory system due to pulmonary hypertension. To study the condition of periodontal tissues, a large arsenal of functional research methods is used: biomicroscopy, rheoparodontography, polarography, radioisotope method, Dopplerography. When studying the state of the periodontal vascular system, the methods of rheoparodontography, polarography, and Doppleroscopy have become the most widespread. Various installations were used to perform contact biomicroscopy of the gum: a light microscope, a slit lamp, a capillaroscope, and a stomatoscope. These research methods make it possible to observe the angioarchitectonics and functional state of microvessels of the mucous membrane and register some microvessel parameters during image analysis. In a healthy periodontal, the area occupied by capillaries in the visual field ranges from 10 to 30 square micrometers. The inner surface of the gum is supplied with blood by glomeruloids located in the form of a "front garden" in the gingival papillae. They ensure a tight fit of the gums in the area of the tooth neck by forming a vascular "cuff" and perform the task of a hydrostatic separation lining. At the first signs of inflammation, the glomeruloids disappear. The loss of barrier function by periodontal tissues due to the period of formation and stabilization of arterial hypertension is confirmed to a certain extent by functional research methods: the most informative in this regard is the method of rheoparodontography, which allows determining the main indicators of local hemodynamics - vascular tone and the degree of blood filling of the vascular bed. The rheoparodontography method is based on graphical registration of changes in the resistance of periodontal tissues when an electric current passes through them and allows assessing the condition of the vascular wall.

A rheoparodontogram has the character of a sphygmogram and is normally characterized by a rapid rise in the ascending part, a sharp peak, and a well-defined incision on the descending part. In this case, there are 3 possible variants of the state of tone of the periodontal vessels that affect the nature of the recorded curve: normal tone (dicrotic wave in the middle part of the catacroty), decreased tone (dicrotic wave in the lower third of the catacroty), increased tone (dicrotic wave in the upper third of the catacroty).

The average figures of the peripheral resistance index are 62.2%, and the elasticity index is 105.3%. For the lower jaw: normal vascular tone of 30%, decrease in tone 40.0%),

increase 30.0%, while matching the tone of the finger in 44.7% of cases. The average value of the peripheral resistance index is 74.7%, and the elasticity index is 94.4%. The correspondence of the tone of the bearing vessels of the upper and lower jaws in 44.0% of cases. Thus, hypotension is more often registered in the upper jaw, and hypertonicity in the lower jaw. In patients with generalized periodontitis combined with hypertension and atherosclerosis, rheoparodontography recorded a decrease in amplitude, smoothing of the rheogram contour and upward displacement of the dicrotic tooth, which indicates increased microvascular tone and deterioration of blood supply to tissues. A longer course of hypertension was accompanied by a significant deterioration in rheoparodontography, which was confirmed by other methods of functional examination. When analyzing rheoparodontography in patients with moderate chronic generalized periodontitis with normal blood pressure, I found a decrease in the rheographic index with concomitant persistent arterial hypertension. Temporary shifts in the descending part of the rheoparodontogram indicated a difficulty in venous outflow, while maintaining a clear dependence on the degree of inflammation. It was noted by a decrease in the steepness of the slope of the ascending part of the curve, the presence of additional waves and a displacement of the dicrotic tooth to the top, which indicated a significant violation of regional blood circulation in periodontitis in patients with periodontitis [2,4,5,6,8,10,12,14,16,18].

With labile hypertension, that is, in the initial stage of hypertension, the inflammatory process in periodontal tissues may prevail, and in later stages it may be dystrophic, although no literature on this problem has been found. Clinical examination of patients with hypertension included subjective, objective and additional research methods. During the examination, all patients underwent repeated blood pressure measurements and heart rate calculations, the condition of fundus vessels, X-ray examination of the heart and large vessels, ECG examination, general blood, urine tests, lipid metabolism, blood coagulation system, Zemnitsky, Nechiporenko samples were performed, the content of residual nitrogen, urea, uric acid, creatinine, etc. The medical history took into account: the age of the examined person, the prescription of hypertension, the nature and duration of headache, the presence of dizziness and tinnitus, flashing "flies" in front of the eyes, a tendency to palpitations and fatigue, physical weakness, as well as the presence of previous and concomitant diseases, burdened heredity for GB, bad habits, occupational harmfulness, meteosensitivity, psychoemotional overexertion, the frequency of hypertensive crises and the use of antihypertensive drugs For an objective assessment of the patient's condition, we measured blood pressure using the generally accepted Korotkov method. Blood pressure was measured in the patient's sitting position, after 5 minutes of rest, 3 times with an interval of 2-3 minutes.

BP was calculated as the arithmetic mean between the two closest values. One of the objective signs indicating vascular changes in HD is the dynamics of fundus vessels. In the early stages, only vascular changes are usually detected: narrowing and tortuosity of the retinal arteries, dilated veins (a symptom of Salus and Gwyst). Hemorrhages are one of the manifestations of hypertensive fundus lesions. Later, degenerative foci appear in the retina in the area of the nipple of the optic nerve in the form of white spots (the picture of "retinitis"). The condition of the periodontal vascular bed was studied by performing rheoparodontography, determining the resistance of the gingival capillaries according to the method of V.I. Kulazhenko, as well as calculating the peripheral circulation index. During the examination, the hygienic condition of the oral cavity was determined in all patients according to the method of Yu.T. Fedorova - V.V. Volodkina, they asked about the usual hygienic oral care for the patient, about the use of various hygiene products. The periodontal condition was determined using the papillary-marginal-alveolar index (PMA), the periodontal index (PI), and the periodontal disease Need index (CPITN).

2. Conclusions

20 patients with GB had mild periodontitis, while 8 (40.0%) patients were diagnosed with GB stage I, and 12 (60.0%) patients with stage II. In patients with mild chronic generalized periodontitis, the mucous membrane of the gums was slightly hyperemic and edematous. Bleeding gums were rarely observed, mainly during hard meals, which corresponded to 2 points on the WHO bleeding index. The Schiller-Pisarev test was weakly positive, there was exposure of the necks of the teeth by 1/3 of the root length and the presence of shallow periodontal pockets-3-3.5 mm. The mobility of teeth of the first degree was determined in some places. Among patients with chronic generalized periodontitis, generalized periodontitis of moderate severity prevailed in 12 (42.8%) at the first stage, and in 60 (19.5%) at the second stage of GB.

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