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EVALUATION OF THE FUNCTIONAL STATE OF VASCULAR ENDOTHELIAL CELLS IN PATIENTS WITH REACTIVE DYSTROPHIC DISEASES OF THE SALIVARY GLANDS


L.R. Jumaev, S.J. Hamraev

Bukhara State Medical Institute, Republic of Uzbekistan, Bukhara

ABSTRACT

Due the fact that in 70% of cases of admission of patients with diseases of the salivary glands, the correct diagnosis causes significant difficulties, this issue remains an urgent problem of modern medicine. The aim of this study is to study the anticoagulant and fibrinolytic properties of the vascular wall endothelium, as well as to determine the markers of endothelial dysfunction - homocysteine and endothelin in patients with reactive dystrophic diseases of the salivary glands. This article presents the results of a survey of 64 patients with reactive dystrophic diseases (RDD) and inflammatory diseases of the salivary glands (SG) at the age of 20 to 55 years. As a result, it found that, in contrast to healthy individuals, there is an increase in the serum content of not only homocysteine, but also endothelin I. The obtained data allow us to conclude that in patients of this category there are significant violations of the vascular wall thrombosis resistance, which manifested by changes in the anticoagulant and fibrinolytic properties of the endothelium. It also found that in this pathology, there is an increase in the serum content of not only homocysteine, but also endothelin I.

Key words: *salivary glands, reactive dystrophic diseases, sialadenosis, oral fluid, endothelial cells, nitric oxide.*

ОЦЕНКА ФУНКЦИОНАЛЬНОГО СОСТОЯНИЯ ЭНДОТЕЛИАЛЬНЫХ КЛЕТОК СОСУДОВ У БОЛЬНЫХ С РЕАКТИВНО-ДИСТРОФИЧЕСКИМИ ЗАБОЛЕВАНИЯМИ СЛЮННЫХ ЖЕЛЕЗ

Л.Р. Жумаев, С.Ж. Хамраев

Бухарский государственный медицинский институт

АННОТАЦИЯ

По причине того, что в 70% случаев поступления больных с заболеваниями слюнных желез, постановка правильного диагноза вызывает значительные затруднения, этот вопрос остается актуальной проблемой современной медицины. Целью данного исследования является изучение антикоагулянтных и фибринолитических свойств эндотелия сосудистой стенки, а также определение маркеров эндотелиальной дисфункции - гомоцистеина и эндотелина у больных с реактивно-дистрофическими заболеваниями слюнных желез. В данной статье приведены данные обследования 64 больных с реактивно-дистрофическими заболеваниями (РДЗ) и воспалительными заболеваниями слюнных желез (СЖ) в возрасте от 20 до 55 лет. В результате установлено, что при РДЗ СЖ, в отличие от здоровых лиц, происходит увеличение содержания в сыворотке крови не только гомоцистеина, но и эндотелина I. Полученные данные позволяют заключить, что у больных данной категории происходят значительные нарушения тромборезистентности сосудистой стенки, которые проявляются изменением антикоагулянтных и фибринолитических свойств эндотелия. Также установлено, что при данной патологии происходит увеличение содержание в сыворотке крови не только гомоцистеина, но и эндотелина I.

Ключевые слова: слюнные железы, *реактивно-дистрофическими заболевания, сиаладенозы, ротовая жидкость, эндотелиальных клеток, оксида азот.*

Relevance. The endothelium - the inner lining of blood vessels - takes an active part in the regulation of vascular tone, producing various biologically active substances (BAS). BAS, which act on the endothelium, are produced by platelets, white blood cells, mast cells or are activated in the blood plasma, some of the substances are synthesized in the endothelium itself and act on endothelial cells either after they are excreted into the bloodstream, or paracrine. The effect on endotheliocytes of BAS is associated with the presence of specific receptors on endotheliocytes, the stimulation of which causes vasodilation or vasoconstriction [1,4,6].

In endothelial dysfunction (ED), the functional state of the internal lining of the vessels is disturbed, which leads to the production of an excessive amount of nitric oxide (NO) [3,5]. Large amounts of NO in the blood can form peroxynitrite, which activates the process of free radical oxidation of proteins and lipids. Therefore, one of the reasons for the violation of regional blood circulation and microcirculation is endothelial dysfunction, which can lead to vascular spasm, increased thrombosis and increased adhesion of white blood cells to the endothelium. Nitric oxide is

involved in the regulation of almost all endothelial functions (regulation of vascular tone, vascular thrombosis resistance), and is also the most sensitive factor to damage [6,7].

Endothelial dysfunction has another, no less important aspect - hemostatic disorders. As long as the endothelium is intact, it is not damaged, it synthesizes mainly anticoagulation factors, which are also vasodilators. In addition, the endothelium adsorbs numerous anticoagulant substances from the blood plasma. The combination of anticoagulants and vasodilators on the endothelium under physiological conditions is the basis for adequate blood flow, especially in the microcirculation vessels.

With prolonged damage to the endothelium, according to many researchers, it begins to play a key role in the pathogenesis of a number of systemic pathologies, in particular in MS. This is due to the switching of endothelial activity to the synthesis of oxidants, vasoconstrictors, aggregates, and thrombogenic factors. And it is platelets that are the main cells that ensure the normal course of hemostasis, the main function of platelets is their participation in the processes of blood clotting.

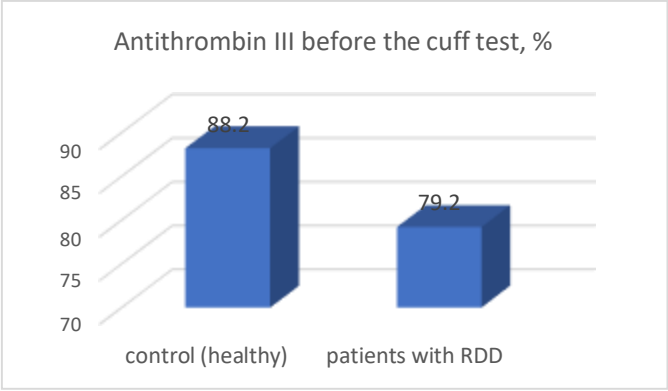
The purpose of the study. To study the anticoagulant and fibrinolytic properties of the vascular wall endothelium, as well as to determine the markers of endothelial dysfunction - homocysteine and endothelin in patients with reactive dystrophic diseases of the salivary glands.

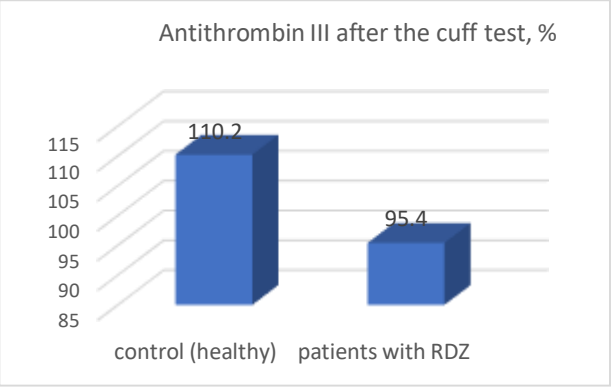
Material and methods of research. A study of 64 patients with reactive dystrophic diseases of the salivary glands (RDD) and inflammatory diseases of the salivary glands at the age of 20 to 55 years conducted. The control group consisted of 20 practically healthy individuals.

Blood sampling performed in the morning, on an empty stomach, at rest. From the ulnar vein of one arm, blood taken by gravity into a vacuum tube with EDTA. After sampling, the test tube placed on ice and transported to the laboratory. The blood centrifuged for 10 minutes at a speed of 1000 revolutions per minute at a temperature of 40°C on a Beckman coulter Allegra X-30R centrifuge. The samples were stored at a temperature of - 20°C until the analysis carried out. Enzyme immunoassay for 49 determination of the quantitative level of ET-1 performed using the test system Biomedical ENDOTELIN (1-21) of JSC "Biochemmak". In addition, the activity of antithrombin III determined by the photometric method, platelet aggregation by the method proposed in 1989 by A. S. Shitikova , fibrinolytic activity of the endothelium of the human vascular wall [2,3].

The results of the studies were processed using the Student's T-test (t) and the probability of error (p). At $p<0.05$, the differences between the two samples were considered significant. For statistical processing of the results, we used the Microsoft Excel software package using the data analysis package.

Results and discussion. The obtained data indicate that the examined patients have inhibition of anticoagulant activity of the vascular wall endothelium. In the examined patients, there is a statistically significant decrease in the activity of antithrombin III in the blood before and, to greater extent, after the occlusion test, as well as a decrease in the index of anticoagulant activity of the vascular wall endothelium compared to clinically healthy volunteers. Thus, the activity of antithrombin III in the blood before and aft er the cuff test, the index of anticoagulant activity of the vascular wall endothelium significantly decreases (Fig. 1).





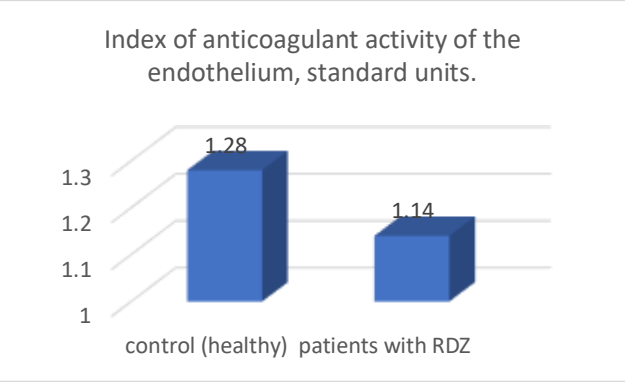


Fig. 1. Indicators of anticoagulant activity of the vascular endothelium in patients with reactive dystrophic diseases of the salivary glands

During the comparative analysis, it found that the activity of antithrombin III in the blood before and, especially, after the occlusion test, as well as the index of anticoagulant activity of the endothelium of the vascular wall is statistically significantly lower in patients compared to healthy individuals. In this pathology, anticoagulant activity of the endothelium of the vascular wall, which manifested by a decrease in endothelial secretion of antithrombin III.

When assessing the fibrinolytic activity of the endothelium of the vascular wall, it was found that in patients with RDD of the SG , there is a statistically significant increase in the time of Hageman-dependent fibrinolysis before and, especially, after the cuff test, compared with clinically healthy volunteer donors.

At the same time, in the comparative groups, there was a decrease in the index of fibrinolytic activity of the vascular wall endothelium (Figure 2), which reflects a decrease in the release of tissue plasminogen activator by endotheliocytes and / or an increase in the production of a plasminogen activator inhibitor.

The differences in the index of fibrinolytic activity of the vascular wall endothelium in the examined individuals are not expressed equally and the time of Hageman-dependent fibrinolysis before and after the cuff test is statistically significantly longer in individuals with pathology, which

indicates a more pronounced inhibition of fibrinolytic activity and is associated with a more significant imbalance in the release of the tissue plasminogen activator and its inhibitor by endotheliocytes. Consequently, the fibrinolytic activity of the vascular endothelium is higher in RDD SG than in healthy individuals.

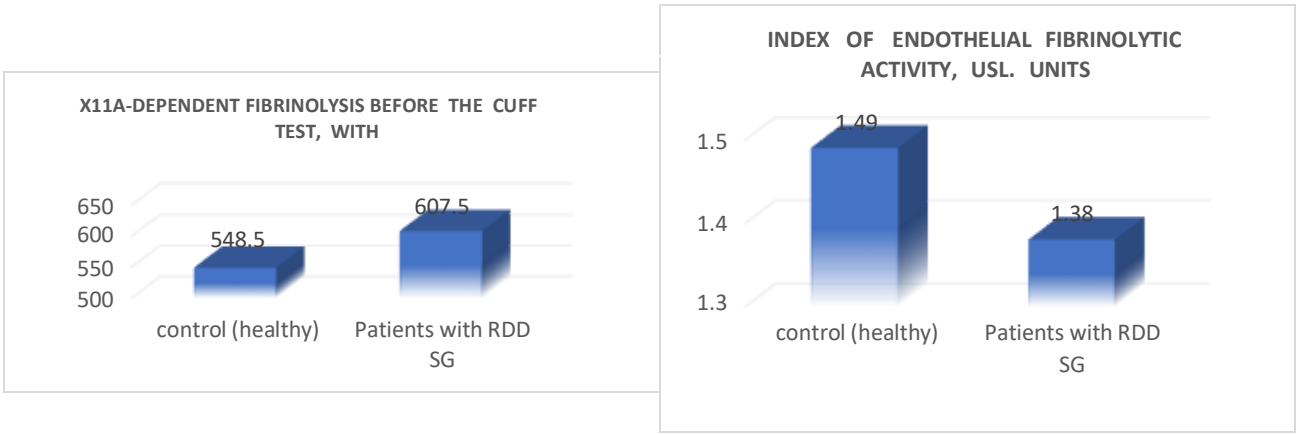


Fig. 2. Indicators of fibrinolytic activity of the vascular endothelium in patients with CGP-associated MS

Thus, as a result of the conducted studies, it was found that in RDD SG, changes in the fibrinolytic activity of the vascular wall endothelium occur, which are manifested by a decrease in the induced release of the tissue plasminogen activator and/or an increase in the release of its inhibitor. The obtained data allow us to conclude that in patients with RDD SG there are significant violations of the thrombosis resistance of the vascular wall, which manifested by changes in the anticoagulant and fibrinolytic properties of the endothelium. At the same time, disorders of both anticoagulant and fibrinolytic activity of the vascular endothelium predominate in comparison with healthy individuals (Fig.3).

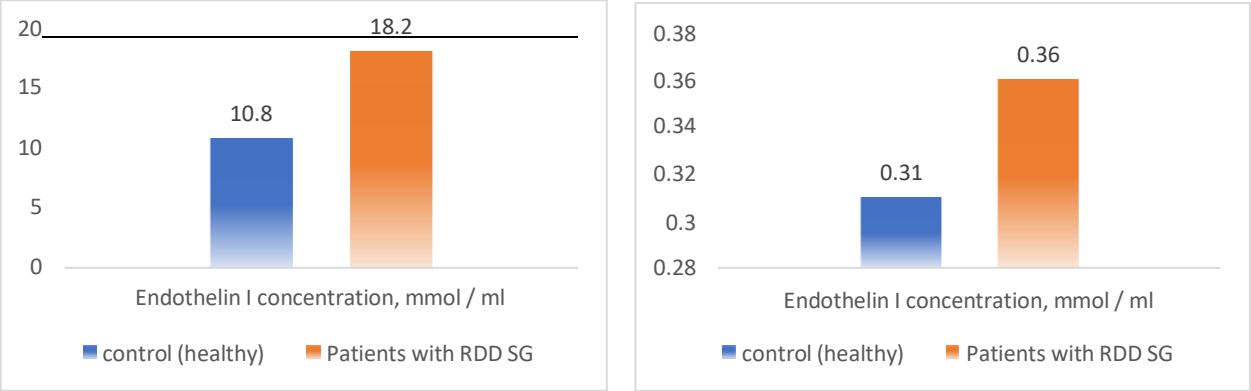


Figure 3. Blood homocysteine and endothelin 1 levels in patients with CGP-associated MS

To assess endothelial dysfunction, the serum concentrations of homocysteine and endothelin we studied in the examined patients. As result of the conducted studies, it found that the examined patients had a statistically significant increase in the content of homocysteine in the blood serum compared to clinically healthy volunteer donors. At the same time, in the examined patients, the concentration of homocysteine and endothelin I in the blood serum statistically significantly higher compared to healthy individuals.

Conclusion. Thus, it found that in RDD SG, in contrast to healthy individuals, there is an increase in the serum content of not only homocysteine, but also endothelin I. The obtained data allow us to conclude that in patients of this category there are significant violations of the thrombosis resistance of the vascular wall, which manifested by changes in the anticoagulant and fibrinolytic properties of the endothelium. It also found that in this pathology, there is an increase in the serum content of not only homocysteine, but also endothelin I.

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ДИНАМИКА РЕЗУЛЬТАТОВ ЛЕЧЕНИЯ УРОЛОГИЧЕСКИХ ЗАБОЛЕВАНИЙ ЛАПАРОСКОПИЧЕСКИМ МЕТОДОМ С УЧЕТОМ СТЕПЕНИ ОСВОЕНИЯ ЛЕЧЕБНОЙ ТЕХНОЛОГИИ

Б.А.Аюбов[1], Ш.Т.Мухтаров[1], Ф.А.Акилов[2], Д.Х.Мирхамидов[2], М.М.Бахадирханов[1], Дж.А.Назаров[1], Н.Д.Уралова[1]