BIOMARKERS OF OXIDATIVE STRESS AND ANTIOXIDANT SYSTEM IN EXPERIMENTAL GINGIVITIS AND THE CORRECTION WITH PLANT ANTIOXIDANTS

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Relevance. Strengthening the peroxidation processes play an important role in the pathogenesis of many human diseases, including inflammatory lesions of periodontal tissues. Under normal conditions, the oxidation and reduction processes are balanced. In the case of increased intake of xenobiotics, depletion of antioxidant depots, irrational nutrition and other negative effects, oxidative stress occurs, which is characterized by a violation of the prooxidant and antioxidant balance with the predominance of the former and the development of oxidative damage. In this regard, antioxidants are increasingly used to stabilize cell membranes and improve repair processes [1, 2, 3].

On the pharmaceutical market today, many medicinal compositions containing antioxidant vitamins, as well as special nutritional supplements with antioxidant effect, are advertised, which show a much better therapeutic and prophylactic effect than synthetic analogs. In recent years, special interest of researchers has attracted oil from the bones of grapes (Oleum *Vitis viniferae*), which has a powerful antioxidant effect and is part of a number of pharmaceuticals [4, 5].

The purpose of our study is to study the prooxidant-antioxidant state in experimental gingivitis and the effectiveness of antioxidant therapy with oil from grape seeds.

Materials and methods. Experimental gingivitis was induced in white rats by the method [6]. The state of lipid peroxidation processes was evaluated by the activity of ceruloplasmin and the antioxidant-prooxidative index (API), which was calculated as the ratio of activity of catalase determined to the concentration of malonic dialdehyde (MDA) [7].

The results of the study of the state of lipid peroxidation (LPO) and antioxidant state (AOS) in blood serum showed that in rats with experimental gingivitis, activation of lipid peroxidation occurred, as evidenced by an increase in MDA concentration by a factor of 2.3, as well as a decrease in antioxidant protection, namely, a decrease in catalase activity by a factor of 1.6. Such violations of the prooxidant-antioxidant state lead to a decrease in the IPA by 3.8 times. Also, an increase in the activity of ceruloplasmin in the blood serum was observed 1.6 times (by 65%) compared to the intact control index. Since ceruloplasmin is considered as the "acute phase protein" of the inflammatory process [84], it is possible to ascertain the presence of inflammatory phenomena in the control group of animals. Application of grape seed oil to the affected gums for 5 days with experimental gingivitis contributed to the normalization of IPI and ceruloplasmin activity (there was no statistically significant difference in ceruloplasmin, catalase, MDA, and API in this group with similar indices of the intact group).

The analysis of the performed study of LPO and AOS values in the gum tissue homogenate after gingivitis modeling showed that the animals of the control group experienced a decrease in catalase more than 1.6 times and an increase in MDA concentration by 1.4 times. IPA has decreased more than 2 times. Application of oil from grape seeds in the form of applications completely suppressed the flash of LPO and restores antioxidant protection, which is reflected in the API index, which did not differ from that of the intact group.

Thus, in the pathogenesis of gingivitis, an important role belongs to the activation of lipid peroxidation and the reduction of antioxidant protection. Application of oil from grape seeds with experimental gingivitis promotes normalization of biomarkers of oxidative stress and antioxidant protection.

With gingivitis, plant antioxidants are an effective complement to drug therapy. The effectiveness of therapy for inflammatory periodontal diseases can be judged by the changes in biomarkers of oxidative stress and the state of the antioxidant system.

Prospects for further research. Determination of biomarkers of oxidative stress and antioxidant state in patients with inflammatory periodontal diseases and study of the effectiveness of the use of plant antioxidants in complex treatment.

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