The Role of Prooxidant-Antioxidant System in the Development of Alveolitis after Teeth Extraction

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Abstract

The objective of research was to study the features of prooxidant-antioxidant status in patients with postoperative alveolitis. The study involved 2 groups – the control group (healthy) included 10 people; the main group (32 patients after tooth extraction in which postoperative alveolitis developed). To assess the intensity of lipid peroxidation processes in the oral cavity, the determination of the content of secondary products of lipoperoxidation by reaction with thiabarbituric acid was used. To evaluate the performance of the enzymatic link of the oral fluid actioxidant system (AOS), the enzyme activity of the first (superoxide dismutase (SOD) and second (catalase) lines of antiradical protection was determined. The level of malondialdehyde in patients with alveolitis was 1.9 times higher than in the control group; the level of hydroperoxide lipids also increased 8.1 times higher than the control group ($p < 0.05$). A study of the status of antioxidant protection in patients with postoperative alveolitis revealed a statistically significant decrease in SOD content by 51.0 % compared with the group of healthy individuals. Also, we observed a slight increase in catalase activity in the group of patients with alveolitis by 50.0 %.

The level of SH-groups in patients of the main group was 2.34 mmol / l and was by 58.6 % statistically significantly lower compared to the same indicator in the control group. Activation of free radical oxidation of biomolecules and depletion of both non-enzymatic (SH-group) and enzymatic (superoxide dismutase) levels of antioxidant protection are observed in the oral fluid of patients with alveolitis, as well as a compensatory increase in catalase activity.

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Introduction

Tooth extraction surgery is one of the most common surgeries in dental practice. The number of complications is very large. They are general and local. The most common post-extraction complication is lumbar alveolitis. According to various authors, inflammation after tooth extraction occurs from 15 % to 35 %.[1,2] The literature provides sufficient evidence to demonstrate the effectiveness of sound oral hygiene to prevent the development of inflammatory complications after surgery to remove a tooth, that necessitates a comprehensive study of their mechanisms.

Recent studies have experimentally and clinically demonstrated the key role of lipid peroxidation (PLO) in the development of toxic hypoxia in a number of pathological conditions, in particular post-extraction alveolitis.[3,4,5] Currently, there has been a growing interest in the clinical aspects of the study of the processes of free radical lipid oxidation in dentistry. This is largely due to the fact that a defect in this metabolism is able to significantly reduce the resistance of the organism to the effects of adverse environmental factors, as well as to create the preconditions for the formation and acceleration of alveolitis.[6,7]

A high level of PLO is a general nonspecific

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