

This paper has investigated the effect of micro and nano powder additives on the mechanical properties of a fiber composite designed for applications in bone surgery. The aim was to find and verify a suitable ratio of powder additives that can be used to increase the biocompatibility, aiming at optimum mechanical properties for the assumed final application as substitutes for hard tissues, mainly taking into account toughness and bending characteristics. It has been shown that in general both the micro and nano fillers reduce the modulus of elasticity in bending (when these values are compared with those of the cortical bone), which appears to be an advantage. The strength in bending is increased by the addition of nano powders. On the other hand, micro particles tend to produce a negative effect, which is probably due to their non-uniform dispersion in the composite matrix or due to the formulation of the aggregates, as has been shown by image analysis. For this reason, it can in general be stated that nano powders have a more favourable effect on the mechanical properties than do micro fillers. From the point of view of mechanical properties, the addition of 10-15 vol. % appears to be the optimum amount with which a suitable optimization of the mechanical properties is achieved without any changes in the inner structure of the composite. The formation of cracks with additive volumes above 20 vol. % (or in case of micro fillers the formation of aggregates) could have a negative effect on the long-term properties of the composite, especially on the further propagation of cracks and on the fatigue strength.

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# COMPARISON FOR IgA, IgG CHANGES OF THE SERUM OF BLOOD AND ORAL FLUID FOR PATIENTS WITH ODONTOGENIC ABCSESSES IN MAXILLOFACIAL AREA WHEN DIFFERENT REHABILITATION PROCRDURES APPLIED

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## Introduction

Pyoinflammatory diseases of odontogenic aetiology present one of complicated part of maxillofacial surgery our days. This situation is aggravated by increasing number of hard complications of the odontogenic infection, increase in quantity of people with allergic reactions on the medicines and having contradictions for physiotherapy treatment. The fact that etiologically significant microorganisms acquire resistance to many modern antibacterial medicines very quickly. Microorganism, its resistance, sufficient adaptive potential have determinative role in pyoinflammatory diseases of this localization development at the modern stage. [7]. All this determines necessity to find out new effective methods of rehabilitation for patients with this pathology. Modern national and foreign literature say about effective human body homeostasis normalization with acupuncture (A) for general pathology and treatment of maxillofacial diseases [2,5]. There are many confirmations about successful acupuncture application separately and in complex treatment for diseases of inflammatory genesis of different localization [1,4]. Our days, one of perspective directions in different diseases diagnostics is oral fluid (OF) examination. Its indices describe oral cavity homeostasis as well as human body state in general [3,6]. Examination of the oral fluid indices has advantages. It is noninvasive, informative, practically harmless, can be reproduced many times. Problem of advisability for acupuncture application in pyoinflammatory diseases treatment in maxillofacial area and of the neck is not resolved till now. There is no scientific foundations for this treatment application based on immunological indices of OF as one of fluid mediums of the human body. Mentioned above determine topicality of the work.

Aim of the work is to examine comparative changes of the IgA, IgG indices in the serum of blood and oral fluid for patients with odontogenic abscesses in maxillofacial area when different rehabilitation procedures applying.

## Objects and methods

We examined 40 patients with odontogenic abscesses in maxillofacial area. 20 patients of them had abscesses of mylohyoideus area and 20 patients – abscesses of pterygoid mandibular space pterygoideus mabdibularis area. All patients passed treatment course in Septic Department of Maxillofacial Surgery. When patients went for the medical

care in the admission office, they underwent primary surgical d-bridement of the suppurative focus (PDB) orally. This procedure included abscess exposure, wound instillation with antiseptic solution, rubber drainage installation. Patients also passed standard course of complex antiphlogistic therapy consisted of antibacterial medicines, nonsteroid antiphlogistic preparations, desensitizing and tonic drugs of common action application. Patients had wound bandaging daily. All patients were divided into 2 groups in 20 persons per group. Patients of the group I had only standard rehabilitation course postoperatively. Patients of the group II had standard rehabilitation course and acupuncture treatment postoperatively consisted of 5 sessions. Group of 10 persons make the group of control. Oral fluid sampling was made in sterile test-tubes. Samplings were kept in liquid nitrogen under temperature of  $-196^{\circ}\text{C}$ . IgA, IgG level in the serum of blood and oral fluid was determined with methods on the base of Mancini using the set «DIALAB» for quantitative determination of IgA, IgG in biological mediums of man. Results were checked in g/l. we examined all indices in different time: before primary surgical d-bridement and 5 days after treatment began.

## Results

During the 1<sup>st</sup> examination IgA level in the serum of blood (SB) consisted  $2,62 \pm 0,28$  in the group I and  $2,83 \pm 0,21$  in the group II. These indices have no authentic difference between of them and indices of the group of control. During the second examination 5 days after the treatment began, IgA level consisted  $2,84 \pm 0,27$  for patients of the group I and had no significant difference with initial indices. At the same period IgA in the SB for patients of the group II consisted  $3,65 \pm 0,26$ . This indices was authentically different from initial indices ( $p < 0,05$ ) and indices of control ( $p < 0,001$ ). During the 1<sup>st</sup> examination IgG level consisted  $14,42 \pm 0,71$  and  $13,55 \pm 0,4$  for the patients of the groups I and II correspondingly. These indices have no difference between of them but have authentic difference with the group of control ( $p < 0,001$ ,  $p < 0,001$  correspondingly). When testing IgG for the next time we determined that patients of the group I IgG indices consisted  $14,22 \pm 0,9$ . It means there were no authentic differences with initial indices. IgG level in the SB consisted  $16,26 \pm 0,13$  for patients treated with acupuncture additionally what was different from initial indices ( $p < 0,001$ ). Comparative appreciation of IgA and IgG indices in BS at the 2<sup>nd</sup> examination for patients treated with acupuncture additionally showed authentic difference with indices of the group I ( $p < 0,05$ ). During the 1<sup>st</sup> examination the level of IgA in the OF consisted  $0,15 \pm 0,02$  at the group I and  $0,1 \pm 0,02$  at the group II. These indices have no authentic difference between of them but they have authentic difference with indices of the group of control ( $p < 0,001$ ). By the second examination 5 days after treatment began IgA level indices consisted  $0,14 \pm 0,02$  for the patients of the group I and had no significant difference with initial indices. At the same period of examination indices of IgA level consisted  $0,37 \pm 0,1$  for the patients of the group II what was authentically different with initial indices ( $p < 0,01$ ) and had no authentic difference with control indices. Comparative appreciation of the IgA indices in the OF at the 2<sup>nd</sup> examination for patients treated with acupuncture showed authentic difference with I group indices ( $p < 0,05$ ). Indices of IgG consisted  $0,98 \pm 0,38$  and  $1,02 \pm 0,34$  correspondingly during the 1<sup>st</sup> examination for the patients of the I and II groups. These indices had no authentic difference. IgG was not found in the normal state. During the second examination of IgG indices we found that IgG consisted  $0,71 \pm 0,12$  for patients of the group I what has no

authentic difference with initial indices. IgG indices in the OF consisted  $2,12 \pm 0,51$  for patients treated with acupuncture what demonstrated the tendency to the authentic difference with initial indices and indices if the group I. Results we achieved have important practical meaning as we know well IgA and IgG influence considerably to the microorganism protection from the infectious agents. In the secretion of the mucous tunic IgA forms local immunity, prevents adhesion microorganisms into epithelium of mucous tunic, forms bacteriotropins for microbial cells, intensifies phagocytosis, prevents from adsorption and viruses reproduction in cells of epithelium. IgG makes the main quantity of the serum of blood antibody, appears in big quantity while the second immune response, consists the main large amount of the antibody against bacteriums, there toxins and viruses. Its activates the complement by classic type when forming the complex with antigen.

## Conclusions

Presented materials and its detailed analysis let to conclude the following: 1) when odontogenic abscesses in maxillofacial area developing, IgA quantity in the oral fluid is reducing and remain practically the same in the serum of blood; quantity of IgG is reducing in the serum of blood and increasing in the oral fluid; 2) indices of IgA, IgG in OF and SB are similar by direction but different by intensity during rehabilitation; 3) oral fluid could be used for diagnostics purposes and process changes appreciation for patients with perimandibular soft tissues of odontogenic etiology; 4) acupuncture application in rehabilitation complex for patients with odontogenic abscesses of perimandibular soft tissues contributes to the increase of immune responsiveness of the human body; 5) basing on the results of IgA, IgG changes in the OF for patients with odontogenic abscesses in the maxillofacial area we can make conclusion that acupuncture has positive influence on the postoperative disease development and could be recommended to be included in the rehabilitation complex for patients with odontogenic abscesses of perimandibular soft tissues.

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