

measured samples showed elastic behavior without presence of brittle cracks. This fact should be caused by non-homogenous distribution of polyamide nanofibers and HA particles, respectively nonhomogenous structure caused by preparation (for illustration see FIG.1). The brittle behavior of GELHA and NF-GELHA composites (in comparison with PAA-COLHA) is also illustrated by higher values of Young's modulus. Based on these results, further optimization of mechanical properties will be carried out by selecting the volume ratio of the fiber reinforcement to the matrix and also reinforcement suitable orientation and layering.

For HA concentration determination the automatically mapping (software Labspec ver. 2.08) has been used. Selected spectrum and collection of measured Raman spectra are depicted in FIG.3. Concentration maps were calculated on the base of band belongs to  $\text{PO}_4^{3-}$  group at  $964\text{cm}^{-1}$ . Mapping of HA concentration in examined composites showed a sufficient and comparable HA dispersion in all cases. Better HA dispersion was showed in the case of NF-GELHA composite. This homogeneity can be connected and probably influence the mechanical properties.

## Conclusions

This study has investigated the possibilities of preparation of composite materials based on various reinforcing materials and matrices. The influence of different composite constituents on mechanical properties of composites mainly based on the biodegradable materials was verified. Further optimization of mechanical properties and verification of proper structure composition are subjects of the future research.

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# DISORDER OF THE MINERAL METABOLISM OF THE ORAL CAVITY FOR PATIENTS WITH ODONTOGENIC ABSCESES IN MAXILLOFACIAL AREA AND WAYS FOR ITS CORRECTION WITH STANDARD METHODS OF REHABILITATION

Y.M.KAZAKOVA, I.O.POHODENKO-CHUDAKOVA\*

BELARUSIAN COLLABORATING CENTRE OF EACMFS,  
BELARUSIAN STATE MEDICAL UNIVERSITY, MINSK, BELARUS  
\*MAILTO: IP-C@YANDEX.RU

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## Introduction

Examination of the oral fluid (OF) has great potential in different diseases diagnostics now. Its indices describe oral cavity homeostasis as well as human body state in general [6].

Bone is a calcified tissue consisted of cells put into the main hard substance. Inorganic components make 70% of this substance and the principal of them is hydroxyapatite [3]. Due to this, great attention is paid to the ions calcium content and its compounds into the fluid systems of the human body for patients with pathological processes of the bone tissue as well as with pyoinflammatory complications of osteomyelitis presented by abscesses and phlegmons [2,4]. Pyoinflammatory process of any etiology is accompanied by morphological and functional disorders. It means that many enzymatic reactions are involved into the pathological process. Hydrolytic enzyme – acid phosphatase (AP) – should be considered as marker of this process. Many works give up to the examination of AP activity into the biological environment of the human body [1,5]. Last time, more attention is paid for micromorphological indices of the OF and its fractions examination [3]. Indices of the OF microcrystallization describe correctly processes of mineralization of maxillofacial area. But there are few works about changes of the OF microcrystallization indices for patients with pyoinflammatory diseases in maxillofacial area during the treatment. All this confirms the urgency of this work.

## Aim of work

is to study mineral metabolism of the oral cavity for patients with odontogenic abscesses in the maxillofacial area and ways of its correction with standard complex of rehabilitation methods.

## Objects and methods

We examined 30 patients with odontogenic abscesses in maxillofacial area. 15 patients had abscesses of mylohyoid area and 15 patients with abscesses of pterygoid mandibular area. When patients went for medical care, doctors used intraoral approach method for the primary surgical d-bridement (PSD) of the suppurative focus and patients were instituted for the standard course of complex antiphlogistic therapy. Bandages were changed every day.

The group of control consisted of 10 healthy persons.

AF activity indices were determined with kinesthetic method using the set for acid phosphatase indices fixation (PBS-«ORGENICS», France). Results were fixed in U/l.  $Ca^{2+}$  ions content was fixed with electrolyte analyzer AVL 984-S (Graz, Austria) in millimole/l. OF microcrystallization indices were determined by our own method and results fixed in Units. All indices were fixed in different time: before PSD and 5 days after the treatment started.

## Results

During examination of the AF activity we found its enzyme level composed  $32,75 \pm 5,13$  and was authentically different from standard ( $p < 0,01$ ) which was  $17,7 \pm 1,7$ . We fixed little reduction of AF and OF indices from  $32,27 \pm 5,13$  to  $27,40 \pm 5,08$  during the treatment. Significant difference was not fixed for these indices. Tendency towards the authentic difference with standard indices during the 2nd examination was kept. Thus, change of AF indices confirms the moderate reduction of the inflammation processes against a background of the standard treatment but AF indices didn't reach the standard indices level.

We fixed significant reduction of the  $Ca^{2+}$  ions during examination of its content in the patient's OF. During the 1st examination this indices was  $0,303 \pm 0,03$  what was authentically less than standard indices ( $p < 0,01$ ) equal  $0,436 \pm 0,02$ . We had no chance to achieve the authentic change of  $Ca^{2+}$  ions level in the OF during the treatment. During the 2nd examination this indices made  $0,257 \pm 0,05$ . To conclude,  $Ca^{2+}$  ions content in the OF is not restoring when standard treatment applied and remains authentically less than standard indices ( $p < 0,001$ ).

Microcrystallization indices were  $2,0 \pm 0,15$  in the group of standard. Patients with diseases mentioned above had microcrystallization indices of  $2,5 \pm 0,06$  when arrived for medical care and it was authentically higher than standard indices ( $p < 0,01$ ). Achieved results confirm that this indices did not change and remained  $2,5 \pm 0,06$  during the 2nd examination when standard treatment applied and kept authentic difference with indices of standard ( $p < 0,05$ ) (FIG. 1).

According to the final biochemical and biophysical indices for OF of patients with odontogenic abscesses in maxillofacial area, this biological environment responds informatively to the development of the pyoinflammatory process in maxillofacial area. Content level of biologically important substances in it has marked changes concerned with disease development as well as its clinical course and processes of homeostasis normalization due to the complex application of treatment procedures and compensatory systems of the organism what corresponds to the information in

the literature [3]. Achieved results demonstrate that standard treatment course applied for patients with pyoinflammatory diseases treatment allows us to obtain satisfactory results. But when information analyzed in details, we saw that patients of this group had difference of indices with indices of standard of indices under the study in the OF on the 5 days of examination even. Higher level of AF and OF was kept,  $Ca^{2+}$  ions level in the OF was not restored and OF indices did not become normal. So, it's necessary to elaborate new more effective and rational complexes of treatment courses for patients with pyoinflammatory diseases treatment.

## Conclusion

1) Patients with odontogenic abscesses in the maxillofacial area had mineral metabolism process disordered in the oral fluid. It's confirmed by change of microcrystallization,  $Ca^{2+}$  ions, OF, AF indices changes;

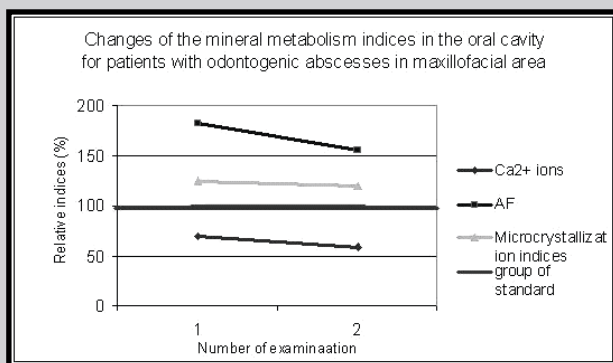
2) Indices of the OF that we chosen for examination are informative. They confirm authentically whether the patient has pyoinflammatory disease: odontogenic abscess in maxillofacial area and reflect mineral metabolism state of the oral cavity;

3) OF should be used for making diagnoses and appreciation of inflammatory process development for patients with odontogenic abscesses in the maxillofacial area;

4) There is no complete normalization of the patient's homeostasis when standard treatment procedures applied.

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**FIG.1. Changes of the mineral metabolism indices in the oral cavity for patients with odontogenic abscesses in maxillofacial area.**