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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

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გამოიცემა თბილისის სახელმწიფო სამედიცინო უნივერსიტეტთან
თანამშრომლობითა და მისი პატრონაჟით

ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

ТБИЛИСИ - НЬЮ-ЙОРК

GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board and The International Academy of Sciences, Education, Industry and Arts (U.S.A.) since 1994. **GMN** carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

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GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией и Международной академией наук, образования, искусств и естествознания (IASEIA) США с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения.

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GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

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При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

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2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

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ავტორთა საყურადღებოდ!

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1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

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6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

Содержание:

PECULIARITIES OF EVALUATION OF THE ORAL FLUID ANTIOXIDANT ACTIVITY IN PATIENTS WITH LOCAL OR SYSTEMIC DISEASES

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Assessment of the state of oxidative homeostasis is one of the most prospective areas of laboratory diagnostics. Despite the low specificity of this marker, changes in its value serve as an important symptom that characterizes patients with a wide range of diseases, allows us to judge the severity of the pathological process, make prognosis and adjust therapy if necessary [4]. To assess the state of balance of the prooxidant - antioxidant system, a large number of markers of oxidative stress and the functional state of the antioxidant defense system are to be determined [7,14]. The intensity of free radical processes is judged by determination in the bioliquids and tissues of the content of oxidative damage products of lipids (malondialdehyde, diene and triene conjugates, etc.) [20], proteins (bityrosine, carbonyl products, etc.) [1], nucleic acids (8-hydroxy-2-deoxyguanosine) [12], as well as the production of reactive oxygen species or the other radicals generated. On the other hand, oxidative stress develops not only as a result of the free radical reactions intensification but also of a decrease in the antioxidant system potential, so it is justified to assess its components' activity. For this reason, the concentration of low-molecular antioxidants, thiol groups of proteins, the activity of anti-radical protection enzymes, etc. are to be determined. One should consider the multicomponent antioxidant system functioning on stages of prevention of free radical processes initiation, the neutralization of radicals and reactive molecules such as hydrogen peroxide, and regeneration of own components, in particular of glutathione for its multiple reuses.

Besides, antioxidants that protect the hydrophilic and lipophilic phases can be conditionally clustered. Thus, assessing the real state of oxidative homeostasis becomes a rather difficult task, which consists of determining the number of parameters that can change in different directions. The way out of this situation can be an assessment of integral indicators determined by the state of several parameters and comprehensively characterize the state of a particular link in the body's nonspecific defense system [6,13]. One of these indicators is the total antioxidant activity, which is determined by various methods, such as amperometric one, which consists of analyzing the total content of substances that can be oxidized on the surface of the working electrode. Among the chemical methods for testing antioxidant capacity, methods based on the assessment of reducing capacity, in particular, the reduction of Fe3+ or Cu2+ with subsequent identification of the reduced form, as well as methods for the radical sorption assessment based on the registration of the neutralization rate of relatively stable radicals are common [2,3,11].

Each method has its advantages and disadvantages, but the most widely used are iron - or copper-reducing techniques, which are based on a few commercial kits designed for clinical laboratory diagnostics and adapted for use on automatic biochemical analyzers (Total antioxidant status assay kit, Randox Laboratories, United Kingdom) or microplate readers (Total Antioxidant Capacity Assay Kit, Abcam; OxiSelect ™ Total Antioxidant Capacity (TAC) assay kit). Recently, the direction of development of non-invasive technologies has been actively developing in laboratory diagnostics, as a result, the significance of analysis of the mixed saliva or oral fluid composition is increasing [15].

In this direction, we can distinguish 2 main applications: the investigation of oral fluid's biochemical parameters to assess systemic pathology (substitution of blood by saliva) and the study of the perspectives for analyzing changes in the composition of bio-liquid on the background of the dental disease. On the one hand, it is widely known that many indicators of blood plasma and oral fluid are well correlated with each other; on the other hand, it is obvious that in presence of a pathological process affecting the oral cavity tissues, local inflammation will have a leading influence on the composition of saliva. The latter limits the use of salivadiagnostics in medical practice, but opens up perspectives in dentistry. The antioxidant system of saliva does not have any fundamental organizational differences from that of blood, and mainly differs in the content of individual components, which include enzymes (peroxidase, catalase, superoxide dismutase, glutathione peroxidase) and low-molecular antioxidants (uric acid, tocopherol, ascorbic acid) [8].

There is a thiol link represented by glutathione, enzymes of its metabolism and SH-groups of proteins [9]. Changes in the total antioxidant activity of oral fluid described by different authors differ dramatically. In a number of situations, the authors describe a decrease in the antioxidant potential of saliva in case of somatic and dental diseases and interpret them as a result of oxidative stress [16,19,22], other authors point out that the development of diseases of various profiles is accompanied by a statistically significant increase in the analyzed parameter, which is also associated with intensification of oxidative processes with the enhanced compensatory activity of the antioxidant defense system of saliva [18,21]. Some authors point to the possibility of the influence of orthopedic structures in the oral cavity on the level of total antioxidant activity [17].

Thus, the interpretation of the study results of oxidative homeostasis of oral fluid causes some difficulties, for the solution of which a parallel assessment of the dynamics of changes in the total antioxidant activity of blood plasma and oral fluid is studied in different categories of patients.

Material and methods. The study of changes of antioxidant activity in the presence of a disease, directly affecting tissues of the maxillofacial region were carried out at the Department of Maxillofacial Surgery of SBME "Krasnodar CBSE "MOH KK with the participation of 42 patients with odontogenic phlegmons (group 2), localized in the pterygoid-maxillary, submandibular or peripharyngeal spaces. These patients were divided into 2 subgroups depending on the therapy. Patients of 2A subgroup (n=19) received traditional treatment, including surgical intervention to open and sanitize the purulent focus, antibiotic treatment and symptomatic therapy. Patients of 2B subgroup (n=23), in addition to the traditional treatment regi- men received a solution of cytoflavin (NTTP Polisan, Russia) (a preparation of succinic acid and energy exchange cofac- tors), which has antioxidant and antihypoxant properties. The blood and oral fluid are taken from the patients of were collected before the start of treatment, on the 1st, 3rd, and 5th days after surgery.

The testing subjects with diseases of the oral cavity were represented by the patients with partial absence of 3-4 teeth (group 3, n=18), whose treatment was carried out based on the dental polyclinic of the Federal State Budgetary Educational Institution of KubSMU of the Ministry of Health of Russian Federation and included restoration of the integrity of the dentition using the method of dental implantation. In the group 4 patients, oral fluid was collected at different stages of treatment: before the installation of dental implants, after the removal of sutures, before the installation of the gum shaper, before the installation of orthopedic structures, and a year after the start of treatment (or 6 months after the installation of orthopedic systems).

To assess changes in antioxidant activity in presence of somatic diseases, the study included patients with the chronic inflammatory uterine disease with the combined course of salpingoophoritis (group 4, n=30) and 20 patients with type 2 diabetes mellitus (group 5). From the group 5 patients the blood and oral fluid were taken once, and from group 4 patients - before and after 14 days of treatment. Herein, depending on the therapy, patients of the 4th group were divided into 2 subgroups of 15 testing subjects. Patients in subgroup 4A received standard treatment, including antibiotic therapy, non-steroidal anti-inflammatory drugs, and vaginal sanitation. Patients of the 4B subgroup additionally received antioxidant agents - retinol, tocopherol, and sodium thiosulfate. Patients of these groups were observed based on the clinic of the KubSMU. An essential criterion for selecting patients in the groups 4 and 5 was a sanitized oral cavity to exclude the influence of local pathological processes. In addition, the material was collected from practically healthy donors who were observed in the same clinic as part of the medical examination of the adult population. The testing subjects of the last category made up the control group (group 1).

The blood was collected from the ulnar vein in a volume of 4-5 ml in test tubes with sodium heparin. The oral fluid was collected by spitting into clean, dry test tubes made of polymer material without salivation stimulation.

The iron-reducing method's total antioxidant activity of the blood plasma and oral fluid was determined (FRAP-Ferric Reducing/Antioxidant Power). The blood plasma was obtained in a standard way; after centrifugation of heparinized blood, preparation of oral fluid also included centrifugation (2600g for 10 minutes), selection of the supernatant fluid and further laboratory operation with it. Biochemical studies were performed immediately after delivering fresh material from the clinic without pre-freezing and long-term storage [10]. The determination was performed under the conditions of incubation of the blood plasma or saliva with Fe3+ ions (in the composition of iron chloride) and 2,2' - dipyridyl, which turns to s a colored compound with Fe2+ ions formed during the reduction of the tested bio-liquid by antioxidants. The color intensity evaluated photometrically at 520 nm is directly proportional to the total antioxidant activity. The obtained data were expressed in mM of ascorbic acid, accepted as a standard and tested under the similar conditions for the calibration graph construction [5]. The study was based on the principles set out in the WMA Helsinki Declaration (Fortaleza, 2013). All subjects provided voluntary informed consent before being included in the study. The independent ethics committee approved the study of the Federal State Budgetary Educational Institution of the Ministry of Health of the Russian Federation (Protocol No. 57 of 29.11.2017).

Statistical data analysis was performed using the Stat Plus program for Windows. The obtained data were compared using the nonparametric criteria of Mann-Whitney for independent groups and of Wilcoxon for dependent groups (indices obtained at different stages of the study in patients of the same group). The article's data are presented in the form of median and quartiles (25th and 75th percentiles). The differences between the indices were considered statistically significant at the level of $p<0.05$.

Results and discussion. Determination of the total antioxidant activity in the oral fluid of patients with dental profile showed a tendency to increase this index. In patients with phlegmon of the maxillofacial region, the level of the analyzed marker initially did not differ from the control value of the indices (Fig. 1). Still, after the surgical resolution of the purulent-necrotic process, the level of the antioxidant potential increased by 48% related to its initial value. On the 3rd day of treatment, a slight decrease in the considered index was registered, followed by a further increase in it. On the 5th day of treatment, the total antioxidant activity of the mixed saliva of group 2A patients receiving a course of traditional therapy exceeded the control parameter level by 95%. On the background of traditional therapy supplemented with cytoflavin, a lower level of iron-restoring ability of oral fluid was maintained. At any stage of treatment, the value of this parameter did not exceed the control values. Interpretation of these results is quite difficult; it is unclear how lower values of the integral index of the functional state of the antioxidant defense system can obviously indicate higher efficiency of energotropic correction. Only at the last stage of observation were different values of the index determined in patients of 2A and 2B subgroups. Patients receiving traditional treatment were characterized by the preservation of initially reduced values of total antioxidant activity. In contrast, in the blood plasma of patients receiving additional cytoflavin, the analyzed index level increased statistically significantly, reaching the level of control values of the same parameter.

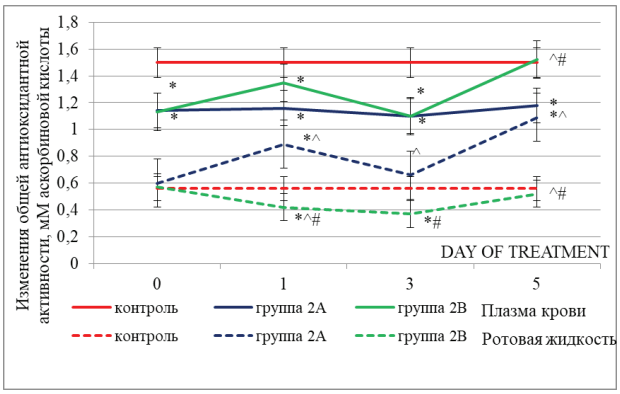

*Fig. 1. Total antioxidant activity of blood and oral fluid in patients with phlegmon of the maxillofacial region during treatment (Me (p0.25-p0.75)) Note: * - statistically significant differences from the indicator of the control group (p<0.05), ^ - statistically significant differences from the indicator obtained at the previous stage of treatment (p<0.05), # - statistically significant differences between the indicators of subgroups 2A and 2B at the corresponding periods of treatment (p<0.05). The control group's indicator was determined once but extended on the graph through all treatment periods for clarity of changes*

The results of the study of the total antioxidant activity of the oral fluid of patients with partial absence of 3and 4 teeth were somewhat similar to the data of the 2nd group. Initially, the level of the index under consideration was increased by 50% (Fig. 2), which was explained by the long-term existence of the patho-

logical process. The absence of teeth is not a harmless condition that has an exclusively aesthetic effect. On the background of even a few teeth absence, there is a significant redistribution of the load on the remaining elements of the dentoalveolar system and surrounding soft tissues, which is accompanied by metabolic changes and is reflected in the chemical composition of mixed saliva.

At the 2nd stage of the study, which took place 2 weeks after the installation of dental implants, the total antioxidant activity decreased to the level of control values, which we associated with the implementation of professional hygiene procedures at the initial examination stage and a high degree of adherence of patients to the recommendations of specialists in maintaining oral health at this stage. However, in the future, when determining the level of the antioxidant potential of mixed saliva after 3 months at the stage of the gum shaper installing, an increased value of 2.2 times still was recorded. At the last stages of the study, which was performed after the orthopedic structure's installation and the dentition integrity restoration, the oral fluid iron-restoring ability values were determined, which did not differ from the level of control.

The evaluation of antioxidant activity at local and systemic levels in the patients with somatic diseases in sanitized oral cavity conditions showed a different nature of changes. Thus, in the patients with inflammatory diseases of the pelvic organs, a reduced value of the analyzed blood plasma index in the acute phase was recorded by 24% relatively to the level of the corresponding index of the control group; herein the oral fluid index corresponded to the value in the practically healthy volunteers' group (Fig. 3).

Therapy course according to the standard scheme did not contribute to statistically significant changes of total antioxidant activity of blood plasma, which remained below the control levels, and therapy, supplemented through an antioxidant orientation, there was a noticeable increase of the parameter by 52% relative to the initial value or to the level of the targets. In the oral fluid at any stage in any of the subgroups of group 4, there were no statistically significant differences between the value of the index and the similar parameter of group 1.

These changes can be interpreted as violations of oxidative homeostasis with a decrease in the protective potential of the antioxidant system of the blood. At the same time, due to the limited inflammatory process of the organs of women's reproductive tract, it was not possible to register these violations in the oral fluid.

As the 4th clinical example, patients with type 2 diabetes mellitus were selected, which were characterized by metabolic disorders affecting almost all organs and tissues of the human body. These should be associated with changes in biochemical parameters both at the systemic and local levels. Indeed, the total antioxidant activity analysis showed reduced values in both studied bio-liquids – the blood plasma and the oral fluid. In the blood

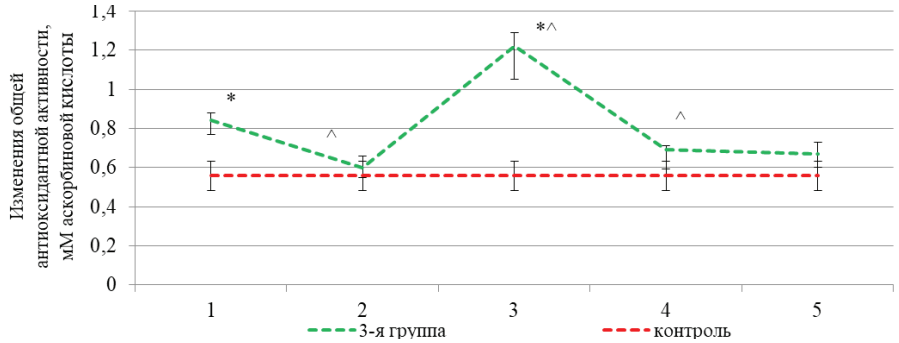

Fig 2. The total antioxidant activity of the oral fluid in patients with the absence of 3-4 teeth in the process of restoring the integrity of the dentition using dental implantation (Me (p0.25-p0.75))
*Note: * - statistically significant differences from the indicator of the control group (p<0.05),*
^ - statistically significant differences from the indicator obtained at the previous stage of treatment (p<0.05)

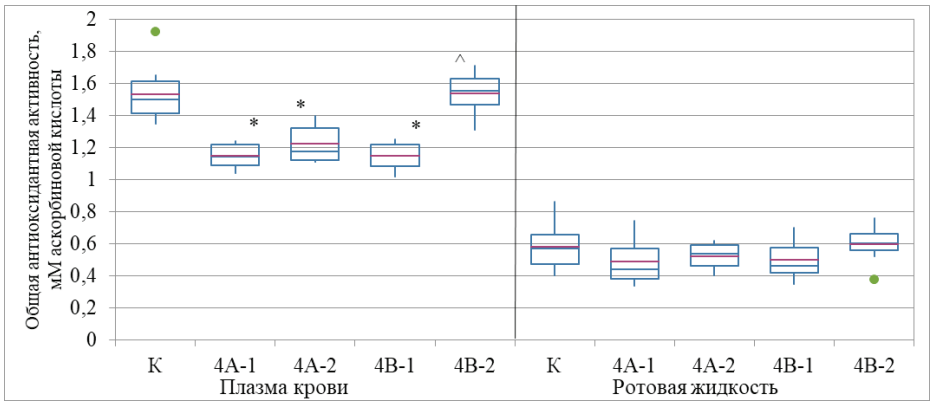

Fig. 3. Total antioxidant activity of blood plasma and oral fluid in patients with inflammatory diseases of the pelvic organs before and after treatment (Me (p0.25-p0.75))
*Note: * - statistically significant differences from the indicator of the control group (p<0.05),*
^ - statistically significant differences from the indicator between the indicators before (subgroup 1) and after (subgroup 2) treatment (p<0.05)

plasma, the level of iron-reducing ability was attenuated to 0.95 (0.89/1.05) mM of ascorbic acid, which was 37% lower than the control value. In the oral fluid, the decrease in the analyzed parameter reached 48% relative to the control (0.29 (0.25/0.36) mM of ascorbic acid).

Thus, in the course of investigations, multidirectional results of the blood plasma's and oral fluid's total antioxidant activity testing were obtained, even though in groups of patients with different nosological forms. To increase the information content of this index assessment, we propose a parallel assessment in both bio-liquids with the following interpretation of the results:

1. If both the studied indices at the local and systemic levels are determined within the typical values, we can indicate the absence of changes in oxidative metabolism and the normal functioning of the antioxidant defense system.

2. If the total antioxidant activity of blood plasma and oral fluid is simultaneously reduced, as in the example of patients with type 2 diabetes mellitus, we may indicate significant impairments of oxidative homeostasis of a systemic nature. This situation is typical for chronic long-term pathological processes, accompanied by an impairment of all metabolism types and a pronounced inflammatory reaction.

3. The Increase in the total antioxidant activity of both studied biological fluids most likely refers to reactive changes of an adaptive or compensatory character. However, we were not able to show such an example in our study. We assume that this situation may be characteristic to compensatory phases of systemic diseases. Still, it should be relatively short-term, since the connection of the prooxidant-antioxidant blood and saliva system provides some delay in the indices changes at the local level, relatively to the organism level. Thus, the presence of a hemato-salivary barrier and the peculiarities of biochemical processes in the oral cavity somewhat separate this location, which ensures the body's nonspecific resistance. Simultaneously, a simultaneous increase in both bio-liquids' studied parameters can be characteristic of an increase in the antioxidant system's protective potential. It is advisable to look for such a problem in athletes or persons undergoing treatment at a health resort.

4. A decrease in the total antioxidant activity of blood plasma on the background of an unchanged oral fluid index may be characteristic of the pathological processes localized outside the maxillofacial region and not having a noticeable prevalence at the systemic level. As an example of this situation, patients with inflammatory diseases of the pelvic organs can serve. The pronounced inflammatory component in this situation provides an intensification of free radical processes and the development of oxidative stress, which is characterized by a decrease in the iron-reducing ability of blood plasma, but not to affect the state of biochemical parameters of mixed saliva.

5. The latter situation occurs when determining an increased value of the oral fluid index on the background of a normal or even slightly reduced level of the antioxidant potential of blood plasma. This situation is most likely for the dental profile diseases, damage to the oral tissues in which it can provoke the leaching of cellular contents, including endogenous antioxidants or other components that have regenerative activity in the oral fluid. At the same time, changes in the antioxidant activity of blood plasma may reflect the prevalence of the pathological process at the systemic level or its limitation only in tissues and elements of the dentoalveolar system. As an example of such a situation, patients with phlegmon of the maxillofacial region or patients with partial absence of teeth can be cited. The last example in our case was incomplete since we have not determined the iron-reducing ability of blood plasma. Still, in real dental practice, the blood sampling is often difficult to provide due to the absence of such a need in the attending physician.

Conclusion. Changes in the total antioxidant activity of blood and saliva can be multidirectional, i.e., an increase or decrease in the index of oral fluid and a decrease in blood plasma parameter can be recorded. Less common is an increase in the antioxidant potential of blood plasma. The depletion of endogenous antioxidants can explain the decrease in total antioxidant activity during the development of oxidative stress, which is especially characteristic of systemic or long-term and sluggish pathological processes. An increase of the analyzed index is explained either by an adaptive growth of the antioxidant defense system's protective potential or by the leaching of cellular antioxidants into the bio-liquid. The latter is the most likely cause of an increase in the iron-restoring ability of oral fluid in the case of damage to the oral cavity tissues and the dentoalveolar system.

To increase the objectivity of the interpretation of the results obtained, it is advisable to simultaneously assess both blood plasma and oral fluid's total antioxidant activity. At the same time, the following variants of detected disorders are possible: a simultaneous decrease in the indicators of both studied biological fluids, peculiar for somatic diseases of a systemic character with a pronounced metabolic disorder; a reduction in the total antioxidant activity of blood plasma on the background of an unchanged oral fluid index, characteristic to somatic diseases that have a limited prevalence and do not affect the tissues of the maxillofacial region; an increase in the total antioxidant activity of the oral fluid on the background of an average or even slightly reduced level of the antioxidant potential of blood plasma, which is typical for diseases of the dental profile. It is less common to find a simultaneous increase in the analyzed index at the local and systemic levels, which may be characteristic of adaptive changes in the antioxidant defense system or the whole system of nonspecific resistance of the human body. Suggestions for interpreting the data presented in the study aim to select the optimal marker in a given situation for monitoring the course of the disease, but not for assessing the prevalence or limitation of the pathological process.

Comparison of changes in the total antioxidant activity of blood plasma and oral fluid on the background of a traditional treatment regimen or the therapy supplemented with antioxidant agents showed the feasibility of correcting the imbalance of oxidative homeostasis and monitoring the effectiveness of such treatment by evaluating the iron-reducing capability of both biological fluids.

REFERENCES

1. Annibal A, Colombo G, Milzani A, Dalle-Donne I, Fedorova M, Hoffmann R. Identification of dityrosine cross-linked sites in oxidized human serum albumin. // J Chromatogr B Analyt Technol Biomed Life Sci. 2016;1019:147-55. doi: 10.1016/j.jchromb.2015.12.022.

2. Apak R, Özyürek M, Güçlü K, Çapanoğlu E. Antioxidant Activity/Capacity Measurement. 1. Classification, Physicochemical Principles, Mechanisms, and Electron Transfer (ET)-Based Assays. // J Agric Food Chem. 2016;64(5):997-1027. doi: 10.1021/acs.jafc.5b04739.

3. Apak R. Current Issues in Antioxidant Measurement. // J Agric Food Chem. 2019;67(33):9187-9202. doi: 10.1021/acs.jafc.9b03657.

4. Basov AA, Elkina AA, Dzhimak SS, Bikov IM, Popov KA,

Kozin SV, Moiseev AV. Changes in prooxidant-antioxidant system indices in the blood and brain of rats with modelled acute hypoxia which consumed a deuterium-depleted drinking diet. // Biology Bulletin. 2019;46(6):531-535. doi: 10.1134/S1062359019060049.
5. Benzie IF, Strain JJ. The ferric reducing ability of plasma (FRAP) as a measure of «antioxidant power»: the FRAP assay. // Anal Biochem. 1996;239(1):70-6. doi: 10.1006/abio.1996.0292.
6. Bykov IM, Basov AA, Malyshko VV, Dzhimak SS, Fedosov SR, Moiseev AV. Dynamics of the pro-oxidant/antioxidant system parameters in wound discharge and plasma in experimental purulent wound during its technological liquid phase treatment. // Bulletin of Experimental Biology and Medicine. 2017;163(2):268-271. doi: 10.1007/s10517-017-3781-3.
7. Cipak Gasparovic A, Zarkovic N, Zarkovic K, Semen K, Kaminskyy D, Yelisyeyeva O, Bottari SP. Biomarkers of oxidative and nitro-oxidative stress: conventional and novel approaches. // Br J Pharmacol. 2017;174(12):1771-1783. doi: 10.1111/bph.13673.
8. Gawron-Skarbek A, Prymont-Przymińska A, Sobczak A, Guligowska A, Kostka T, Nowak D, Szatko F. A comparison of native and non-urate Total Antioxidant Capacity of fasting plasma and saliva among middle-aged and older subjects. // Redox Rep. 2018;23(1):57-62. doi: 10.1080/13510002.2017.1392714.
9. Gyurászová M, Kovalčíková A, Janšáková K, Šebeková K, Celec P, Tóthová Ľ. Markers of oxidative stress and antioxidant status in the plasma, urine and saliva of healthy mice. // Physiol Res. 2018;67(6):921-934. doi: 10.33549/physiolres.933866.
10. Ialongo C. Preanalytic of total antioxidant capacity assays performed in serum, plasma, urine and saliva. // Clin Biochem. 2017;50(6):356-363. doi: 10.1016/j.clinbiochem.2016.11.037.
11. Lee SG, Wang T, Vance TM, Hubert P, Kim DO, Koo SI, Chun OK. Validation of Analytical Methods for Plasma Total Antioxidant Capacity by Comparing with Urinary 8-Isoprostane Level. // J Microbiol Biotechnol. 2017;27(2):388-394. doi: 10.4014/jmb.1604.04053.
12. Lorenzo Y, Haug Berg K, Ringvold A, Petrovski G, Moe MC, Collins A, Nicolaissen B. Levels of oxidative DNA damage are low in ex vivo engineered human limbal epithelial tissue. // Acta Ophthalmol. 2018;96(8):834-840. doi: 10.1111/aos.13811.
13. Marrocco I, Altieri F, Peluso I. Measurement and Clinical Significance of Biomarkers of Oxidative Stress in Humans. // Oxid Med Cell Longev. 2017;2017:6501046. doi: 10.1155/2017/6501046.
14. Niki E. Oxidant-specific biomarkers of oxidative stress. Association with atherosclerosis and implication for antioxidant effects.// Free Radic Biol Med. 2018;120:425-440. doi: 10.1016/j.freeradbiomed.2018.04.001.
15. Peluso I, Raguzzini A. Salivary and Urinary Total Antioxidant Capacity as Biomarkers of Oxidative Stress in Humans. // Patholog Res Int. 2016;2016:5480267. doi: 10.1155/2016/5480267.
16. Punj A, Shenoy S, Kumari NS, Pampani P. Estimation of Antioxidant Levels in Saliva and Serum of Chronic Periodontitis Patients with and without Ischemic Heart Disease. // Int J Dent. 2017;2017:1965697. doi: 10.1155/2017/1965697.
17. Ramezani GH, Moghadam MM, Saghiri MA, Garcia-Godoy F, Asatourian A, Aminsobhani M, Scarbecz M, Sheibani N. Effect of dental restorative materials on total antioxidant capacity and calcium concentration of unstimulated saliva. // J Clin Exp Dent. 2017;9(1):e71-e77. doi: 10.4317/jced.53272.
18. Rezaei F, Soltani T. Evaluation and Comparison of Total Antioxidant Capacity of Saliva Between Patients with Recurrent Aphthous Stomatitis and Healthy Subjects. // Open Dent J. 2018;12:303-309. doi: 10.2174/1874210601812010303.
19. Toczewska J, Maciejczyk M, Konopka T, Zalewska A. Total Oxidant and Antioxidant Capacity of Gingival Crevicular Fluid and Saliva in Patients with Periodontitis: Review and Clinical Study. // Antioxidants (Basel). 2020;9(5):450. doi: 10.3390/antiox9050450.
20. Tsikas D. Assessment of lipid peroxidation by measuring malondialdehyde (MDA) and relatives in biological samples: Analytical and biological challenges. // Anal Biochem. 2017;524:13-30. doi: 10.1016/j.ab.2016.10.021.
21. Zamani-Ahari U, Zamani-Ahari S, Fardi-Azar Z, Falsafi P, Ghanizadeh M. Comparison of total antioxidant capacity of saliva in women with gestational diabetes mellitus and non-diabetic pregnant women. //J Clin Exp Dent. 2017;9(11):e1282-e1286. doi:10.4317/jced.53845
22. Zhang T, Andrukhov O, Haririan H, Müller-Kern M, Liu S, Liu Z, Rausch-Fan X. Total Antioxidant Capacity and Total Oxidant Status in Saliva of Periodontitis Patients in Relation to Bacterial Load. // Front Cell Infect Microbiol. 2016;5:97. doi: 10.3389/fimb.2015.00097.

SUMMARY

PECULIARITIES OF EVALUATION OF THE ORAL FLUID ANTIOXIDANT ACTIVITY IN PATIENTS WITH LOCAL OR SYSTEMIC DISEASES

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The aim - in the given research, the difficulties in interpreting the study results of oxidative homeostasis of oral fluid are analyzed. Changes in the total antioxidant activity of blood and saliva can be multidirectional – an increase or decrease in the oral fluid indicator and a reduction in the parameter of blood plasma can be recorded.

To resolve the emerging difficulties, there was proposed a parallel assessment of the dynamics of changes in the total antioxidant activity of blood plasma and oral fluid in the patients of 4 groups with nosological forms of fundamentally different in the distribution and localization of the pathological process, which include: phlegmons of the maxillofacial region, partial absence of teeth, type 2 diabetes mellitus and the pelvic inflammatory diseases.

As a result of the conducted studies, it was shown that a simultaneous decrease in the total antioxidant activity of blood plasma and oral fluid was attributable to the chronic long-term somatic diseases of a systemic character with a significant metabolic disorder, such as type 2 diabetes mellitus. A decrease in the total antioxidant activity of blood plasma and the unchanged oral fluid index was characteristic of somatic diseases of limited prevalence without affection of the maxillofacial region's tissues. In our case, such an example was a chronic inflammatory disease of the uterus with a combined course of bilateral salpingoophoritis. An increase in the oral fluid's total antioxidant activity on the background of a normal or even slightly reduced level of the antioxidant potential of blood plasma was characteristic of dental diseases.

The latter situation was most likely for the dental profile diseases, in which damage to the oral tissues can provoke the leaching of cellular contents, including endogenous antioxidants or other components of regenerative activity in the oral fluid. Herein, changes in the antioxidant activity of blood plasma may reflect the prevalence of a pathological process at the systemic level or its limitation only to the dentoalveolar system's tissues and elements. As an example of such a situation, the patients with phlegmon of the maxillofacial region or patients with partial absence of teeth can be cited.

Keywords: antioxidant activity, LPO, antioxidants.

РЕЗЮМЕ

АНТИОКСИДАНТНАЯ АКТИВНОСТЬ ОРАЛЬНОЙ ЖИДКОСТИ У БОЛЬНЫХ МЕСТНЫМИ И СИСТЕМНЫМИ ЗАБОЛЕВАНИЯМИ

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Цель исследования - анализ параметров оксидативного гомеостаза ротовой жидкости больных местными и системными заболеваниями.

Проведена параллельная оценка динамики изменений общей антиоксидантной активности плазмы крови и ротовой жидкости у 110 пациентов, которые с учетом нозологических форм, принципиально различных по распространению и локализации патологического процесса, разделены на 4 группы: флегмоны челюстно-лицевой области, частичное отсутствие зубов, сахарный диабет 2 типа и воспалительные заболевания тазовой области.

В результате проведенных исследований (анализ крови и ротовой жидкости) выявлено, что одновременное снижение общей антиоксидантной активности плазмы крови и ротовой жидкости связано с хроническими длительными соматическими заболеваниями системного характера и с нарушением обмена веществ (сахарный диабет 2 типа). Снижение общей антиоксидантной активности плазмы крови на фоне неизменного индекса ротовой жидкости характерно для соматических заболеваний ограниченной распространенности без поражения тканей челюстно-лицевой области, в частности хроническое воспалительное заболевание матки с сочетанным течением двустороннего сальпингоофорита. Повышение общей антиоксидантной активности ротовой жидкости на фоне нормального или даже несколько сниженного уровня антиоксидантного потенциала плазмы крови характерно для стоматологических заболеваний.

При заболеваниях стоматологического профиля, повреждение тканей ротовой полости может спровоцировать вымывание клеточного содержимого, в том числе эндогенных антиоксидантов или других компонентов регенеративного потенциала ротовой жидкости. Изменения антиоксидантной активности плазмы крови могут отражать преобладание патологического процесса на системном уровне или его ограничение тканями и элементами зубочелюстной системы, что характерно для пациентов с флегмоной челюстно-лицевой области или частичным отсутствием зубов.

რეზიუმე

პირის ღრუს სითხის ანტიოქსიდაციური აქტივობა პაციენტებში ადგილობრივი და სისტემური დაავადებებით

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კვლევის მიზანს წარმოადგენდა პირის ღრუს სითხის ოქსიდაციური ჰომეოსტაზის პარამეტრების ანალიზი პაციენტებში ადგილობრივი და სისტემური დაავადებებით.

ჩატარებულია სისხლის პლაზმის და პირის ღრუს სითხის ზოგადი ანტიოქსიდაციური აქტივობის ცვლილებების დინამიკის შეფასება 110 პაციენტში, რომლებიც პათოლოგიური პროცესის გავრცელებისა და ლოკალიზაციის გათვალისწინებით გაყოფილი იყო 4 ნოზოლოგიურ ჯგუფად: ყბა-სახის მიდამოს ფლეგმონები, კბილების ნაწილობრივი არარსებობა, შაქრიანი დიაბეტი ტიპი 2 და მენჯის მიდამოს ანთებითი დაავადებები.

ჩატარებული კვლევის შედეგად დადგენილია, რომ სისხლის პლაზმის და პირის ღრუს სითხის ზოგადი ანტიოქსიდაციური აქტივობის ერთდროული შემცირება დაკავშირებულია სისტემური ხასიათის ხანგრძლივ ქრონიკულ სომატურ დაავადებებთან, ასევე, ნივთიერებათა ცვლის დარღვევასთან, მაგალითად, შაქრიანი დიაბეტი ტიპი 2-თან. სისხლის პლაზმის ზოგადი ანტიოქსიდაციური აქტივობის შემცირება პირის ღრუს სითხის ინდექსის უცვლელობის ფონზე დამახასიათებელია სომატური დაავადებებისათვის შეზღუდული გავრცელებით ყბა-სახის მიდამოს ქსოვილების დაზიანების გარეშე, სახელდობრ, საშვილოსნოს ქრონიკული ანთებითი დაავადება, შერწყმული ორმხრივ სალპინგოოფორიტთან. პირის ღრუს სითხის ანტიოქსიდაციური აქტივობის მატება სისხლის პლაზმის ნორმალური, ან მცირედ შემცირებული ანტიოქსიდაციური პოტენციალის ფონზე დამახასიათებელია სტომატოლოგიური დაავადებებისათვის. აღნიშნული შესაძლოა განვითარდეს სტომატოლოგიური პროფილის დაავადებების დროს, როდესაც პირის ღრუს ქსოვილების დაზიანებამ შეიძლება დააპროვოციროს ენდოგენური ანტიოქსიდანტებისა და პირის ღრუს რეგენერაციული პოტენციალის სხვა კომპონენტების გამორეცხვა უჯრედებიდან. ამასთან, სისხლის პლაზმის ანტიოქსიდაციური აქტივობის ცვლილებები შეიძლება ასახავდეს პათოლოგიური პროცესის დომინირებას სისტემურ დონეზე, ან მის შემოფარგვლას მხოლოდ ყბა-კბილთა სისტემის ქსოვილებით და ელემენტებით. ამის მაგალითს წარმოადგენს პაციენტები ყბა-სახის მიდამოს ფლეგმონით და პაციენტები კბილების ნაწილობრივი არარსებობით.