ISSN 2570-5911
(PRINT)
ISSN 2570-5903
(ON-LINE)
DOI: 10.29256

BIOLOGICAL MARKERS IN FUNDAMENTAL AND CLINICAL MEDICINE

COLLECTION OF ABSTRACTS

VOL. 2
№ 2, 2018

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Editorial Office Address:
ESCBM,
Příkop 838/6, Zábrdovice, 60200 Brno, Česká republika.
Tel. +420773530856

autonomic nervous system using the proposed drug preparation, a significant improvement in the periodontal state was observed. The proposed treatment technique allows to eliminate the manifestations of inflammation and achieve the stabilization of the dystrophic and inflammatory process in the periodontium in shorter terms.

Perspectives for further research. Consequently, the analysis of the results of clinical and laboratory research methods after the conducted complex treatment showed a high therapeutic effectiveness of the proposed medicines in the influence on the periodontal, which will be the basis for the development of other schemes of complex treatment of patients with periodontal disease, depending on the state of the autonomic nervous system.

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Key words: generalized periodontitis, autonomic nervous system.

Accepted for printing on 28 Aug 2018

DOI: 10.29256/v.02.02.2018.escbm82

APPLICATION POTENTIAL OF BIOMARKERS IN PERIODIC DENTAL SCREENING PROTOCOL FOR PATIENTS WORKING IN HARMFUL CONDITIONS

Sydorenko O.O., Sydorenko A.Yul., Voznyi O.V., Pavlov S.V., Zbarakh O.O.
Zaporizhzhia State Medical University, Ukraine

The problem of dental diseases prevention is rather actual, since the results of numerous researches demonstrate that the incidence of the major dental diseases is really high. Due to this, essential preventive protocols have been elaborated which allows prevention of future nosological illnesses. The main criteria in the modern preventive stomatology are the ratio between time that is necessary for a dentist to prevent a disease, benefits of the measures undertaken according to the given prevention protocol, and risks of untimely prevention. All these factors can be minimized, and effective results of nosological disorders prevention can be obtained. The familiar protocols can be improved by introducing modern methods of work with biomarkers, i.e. molecules that are used as identifiers of different diseases, and of an organism's pharmacological reaction to treatment. Only multidisciplinary view of a certain clinical situation allows predicting and elaborating the most real prognostic plan of full rehabilitation. However, owing to modern technologies of biomarkers application, a dentist can quickly and independently improve a patient's dental health.[1,2,3] Numerous studies have confirmed that social-economical (financial state, nutrition, educational level, availability of medical service) and psychological (stressful situations, behavior, low motivation to follow dentist's recommendations) factors proportionally influence patients' dental health.[6] Both systematic and local preventive activity is becoming more and more significant in dental practice where the main aim is elimination of those factors that negatively influence a patient's health, for the sake of prevention of a disease development which might result in more catastrophic consequences, in case of fully pathological course of a dental disease. Search for prognostically important indicators of disease course is determined by the wide spread of pathological processes. In this context, special attention is recently given to the study of composition of oral fluid that is one of the main biological fluids (cytochemical method). The aim of our research is identifying clinical and diagnostic pathogenic meaning of change in concentration of such biomarkers as lactoferrin, vitamin D and vitamin D-binding protein in oral cavity with various dental diseases, and demonstrating the necessity of introduction of biomarkers into periodic screening protocol.[4,5]

Materials and Methods. 100 patients were selected for the present study; they were examined in dental offices and dental clinics. The patients were divided into clinical group, comprising patients who work in harmful conditions, and observational group, made of patients with physiologically normal health indicators and absence of dental pathologies. Values of lactoferrin and cathelicidin in the orl cavity were estimated. Age band of both clinical and observational groups was 25-40 years of age. Oral fluid was collected from the patients in fasting state, early in the morning, by means of spitting into a sterile test-tube. The stock was centrifuged and stored at the temperature -30°C, and the amount of lactoferrin was estimated with the help of enzyme-linked immunosorbent assay. The presence of vitamin D-binding protein in the oral fluid was defined with precipitation assay.

Results. The research enabled to estimate that considerable increase in lactoferrin concentration (more than 60 %) in the oral fluid, comparing to the observation group, was observed in the patients who worked in harmful conditions. Lactoferrin (Lf) is a polyfunctional protein that belongs to transferrins synthesized by epithelial cells, and is contained in different secretory fluids, e.g. saliva. In modern practice Lf is sometimes used as organo-specific marker of catalytic process activation for the purpose of diagnosis and prediction of the course of diseases. It is determined that, being systemic monomarker of inflammatory processes activity, Lf demonstrates intensity of neutrophils activation in biological fluids at autoimmune processes. The concentration of Lf in gum fluid varies considerably depending on the activity of inflammatory process in the oral cavity In patients with oral cavity inflammations this concentration is generally higher than in healthy patients. Patients with periodontium pathology can demonstrate negative correlation between the amount of pathogenic microorganisms and Lf in saliva. Dental treatment enables the decrease of lactoferrin amount in saliva. It has been proved by now that Lf apoform encourages the increase of S.Mutans amount, thus eliminating pathogens from saliva by means of inhibition of biofilm formation. Lf apoform also activates the aggregation of Porfiromonas gingivalis. Consequently, Lf can be used as a sensitive marker of dental process, for prevention of dental diseases and the efficacy of potential pathologies treatment. Alongside with increased lactoferrin amount, decrease in vitamin D concentration (more than 80 %) was registered. It is noteworthy that this pathobiochemical shift occurred on the background of decrease in concentration of vitamin D-binding protein, on average 45 % less in comparison wwith the observation group. [8] In our opinion, the resented alterations of vitamin D metabolism are valuable both for understanding the pathogenesis of oral cavity diseases, and for clinical and diagnostic application. Vitamin D (VD) is a group of biologically active fat-soluble compounds that includes more than 50 metabolites that are formed of sterols in animal and plant tissues under the influence of ultraviolet radiation. At present it has been defined that vitamin D can immediately participate in bone tissue metabolism, directly influencing its cellular elements – hondrocytes, osteoblasts, osteocytes and osteoclasts – though vitamin D receptors (VDR). [9] It is important to point out that the laboratory estimation of serum level of prohormone 25 (OH) D is the most appropriate, reliable and clinically valid method of estimation of VD concentration in human organism. Among all VD metabolites, it is 25 (OH) D that best correlates with mineral density of bone tissue, with calcium level in blood plasma and with intensity of PTH secretion. Besides, half-life of 25 (OH) D is quite prolonged and comprises approximately 15 days which also makes it better for VD-status estimation. For practical laboratories, the use of commercial test-systems for radioimmune, enzymeimmune or chemiluminescence assays is more accessible. [10] It is necessary to mention that more than 20 years ago it was estimated that VD, alongside with mineralization of bone tissue, is capable of intensifying bone resorption. Researches held at that time demonstrated that the mentioned vitamin increases the number and activity of osteoclasts.[11] This property of VD could be manifested in two ways: either by direct influence on osteoclasts that have VDR, or intermediately, by means of osteoblasts function stimulation.[11] Later, in late 1990s at least one of the mechanisms of this VD effect was defined. It was demonstrated on in vitro models that, binding with VDR, 1,25(OH)2 D becomes capable of stimulating the transcription of RANKL gene in osteoblasts. Thus, there occurs an increase in the production of RANKL molecules which interact with corresponding osteoclasts' receptors and potentiate their maturation and increase their activity. This results into reinforcement of osteoclastogenesis and in the increase of bone tissue resorption. Besides, fibroblast growth factor (FGF23) is a significant factor for vitamin D metabolism regulation, as it controls renal phosphates secretion by means of regulating active renal sodium-dependent phosphstes cotransporter NaPi2a and NaPi2c.[8,9] Inhibiting expression CYP27B1 and increasing expression CYP24A1, feedback FGF23, decreases the intensity of 1,25(OH)2D synthesis and increases VD catabolism. Thus, FGF23 is a factor that prevents escalation of VD activity. Correspondingly, oversupply or overgrowth of VD induces FGF23 synthesis which decreases 1,25(OH) 2D level. Main function of 1,25-dihydrovitamin D is maintaining normal calcium (Ca 2+) and phosphorus (HPO4 -2) concentration in blood plasma. They are necessary for adequate mineralization of bone tissue and skeleton formation. That is why VD deficiency in adult people contributes to the development of osteopenia and osteoporosis. This is the reason for employing complex approach to identification of the causes of pathogenic processes of bone system, including osteoporosis. Apart from VD status estimation, it suggests identification of those factors that influence bone metabolism either immediately or intermediately, and the mechanism of VD effectors actualization. Consequently, the main role of VD in bone system formation has been estimated so far. General mechanisms of VD biological effectors that help dentist to identify the presence of pathology and to be strategically aware of a complex approach to any oral cavity disorder have been outlined.

Prospects for further research.The undertaken research helped us to estimate strategically significant alterations of VD, vitamin D-binding protein and lactoferrin concentration in patients working in harmful conditions. Obtained results define prospective viability of this research aimed at the elaboration of informative diagnostic methods and effective methods of prevention of oral cavity diseases in patients who work in harmful conditions.

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Key words: vitamin D-binding protein,biomarkers,lactoferrin,vitamin D,prosthetic rehabilitation

Accepted for printing on 05 Sept 2018

DOI: 10.29256/v.02.02.2018.escbm83

USE OF BIOMARKERS IN PLANNING PROSTHETIC REHABILITATION IN PATIENTS WITH PERIODONTIUM TISSUES DISORDERS

Romaniuk V.N., Voznyi O.V., Pavlov S.V.
Zaporizhzhia State Medical University, Ukraine

According to WHO, about 75 % of population in different regions of the world suffer from partial adentia. Clinical observations demonstrate that in the majority of cases the cause of adentia is generalized periodontitis which is an inflammatory and destructive disease of periodontium tissues that is characterized by inflammation of gums, formation of periodontal pockets and progressing destruction of alveolar ridge which requires dental implantation and prosthetic rehabilitation.[1] Periodontitis is considered one of the most globally spread diseases, with the incidence of 15-20 %. [2] Moreover, periodontitis is connected to other serious diseases such as ischemic heart disease, head and neck carcinoma, and chronic obstructive pulmonary disease. [3-5] At present there are no standard criteria for prosthetic treatment efficacy. In practical work, only functional and aesthetic properties of dentures are estimated which gives their general characteristics alone. Present methods of more detailed estimation of dentures and their impact of periodontium tissues (electromyography, Doppler sonography, rheography, polarography, functional tests) are still under investigation and do not allow to use them in practical sphere. At the same time, the estimation of the prospective results of prosthetic rehabilitation and the analysis of complications, connected with implanting and teeth replacement, allow to assess risk factors, typical of different kinds of dental prostheses, to justify reasonability of their employment and to predict treatment results. In the context of the mentioned above data, there is strong necessity in the introduction of new enlightening, minimally invasive, practically applicable methods of estimation of denture base condition at planning implantological treatment and estimating the efficacy of the performed prosthetic rehabilitation. One of these methods is estimation of the level of biological markers of inflammation processes in oral fluid. The main task of biomarkers is early identification of a disease and conclusive estimation of treatment efficacy. Employing different laboratory methods of oral fluid analysis, it is possible to estimate the activity of the substances that are involved in metabolism at inflammatory diseases of the oral cavity [18]. During recent years the research for the introduction of molecular and biochemical markers analysis into dental practice at various oral cavity diseases has been actively conducted. It is commonly known that periodontitis is an inflammatory reaction; inflammatory process will lead to intensification of the secretion of anti-inflammatory cytokines, such as interleukin (IL) -1a, IL-1β, IL-6 and cachectin a (TNF-a). [6]. After this neutrophils release various enzymes, such as matrix metalloproteinases (MMP) and inflammation mediators. The detection of biomarkers in oral fluid is non-invasive, easily accessible and cost effective. Some clinical researches have revealed that some kinds of oral cavity biomarkers are connected either with the dento-facial system disorders or with systemic diseases [7]. The study of medical literature has confirmed considerable pathogenic role of some biomolecules, namely of matrix metalloproteinases of lactoferrin and cathelicidin, in the development of periodontium tissue diseases. Matrix metalloproteinases are the main proteases that contribute to periodontitis and are connected with periodontologial status. [8, 9] Type I collagen forms bulk of extra-cellular matrix of periodontium, that is why special attention was given to collagenases and gelatinases, suh as MMP-8, MMP-13, MMP-2 and MMP-9 at periodontitis [13]. Among them MMP-8 is the main collagenase at periodontitis; besides, from 90 to 95 % of collagenolytic activity in gum fluid is caused by MMP-8. Thus, at present MMP-8 is considered one of the most prospective biomarkers for diagnosing periodontitis in oral cavity fluid [10]. Though some studies have shown high level of MMP-8 of oral cavity fluid in patients with