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FUNDAMENTALS OF TREATMENT OF CHRONIC CATARRHAL GINGIVITIS IN THE PATHOLOGY OF THE HEPATOBILIARY SYSTEM

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Abstract

The aim of our study was to evaluate the effectiveness of our method of complex pathogenetic treatment of chronic catarrhal gingivitis in 97 patients who were examined at the Department of Hospital Therapeutic Dentistry of the Polyclinic of the Tashkent State Dental Institute. Taken into account that there is a large arsenal of medicinal agents, however, there are no optimal methods for influencing the mechanism of development of inflammatory periodontal diseases in the pathology of the hepatobiliary system (HBS), therefore, the problem of treating chronic generalized catarrhal gingivitis (CGCG) in this pathology is still relevant. Our study was conducted with the aim to study the effectiveness of irrigation of the gums with Parodontax rinsing device with Waterpik WP apparatus for the pathology of the hepatobiliary system.

After the completion of the complex pathogenetic treatment using the irrigation of the gums with Parodontax with the Waterpik WP apparatus, high results were obtained, in which the anti-inflammatory efficiency was defined as a reduction of the PMA index. The PMA value decreased from 22.16 ± 1.64% to 5.65 ± 0.05%, the OHI-s index decreased from 2.31 ± 0.22 to 0.19 ± 0.27; SBI 2.14 ± 0.11 decreased and amounted to 0.14 ± 0.11. Thus, the effectiveness of complex pathogenetic treatment and local application of irrigation of the gums of the Parodontax rinser with the WaterpikWP apparatus is confirmed by the

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results of clinical and biochemical studies.

Keywords: gingivitis, chronic calculous cholecystitis (CCC), irrigation, Waterpik WP irrigator, metrogil denta, pathology of the hepatobiliary system, endogenous intoxication.

Introduction

According to WHO (2002), about 95% of the adult population of the planet have some signs of periodontal disease, 12% of people have a healthy periodontal disease, 53% have initial inflammatory changes. In the age groups of 35–44, 45–54, 55 and older, the number of individuals with initial periodontal changes decreases progressively to 26–15%, with a simultaneous increase in the changes of moderate and severe degree up to 75%.

The prevalence of periodontal disease, according to different authors, reaches up to 98%. Among all periodontal diseases, 90-95% are due to inflammatory processes. 90% of the adult population of industrialized countries reveal signs of gingivitis [1,2,6,8,18, 19].

The pathology of the hepatobiliary system is one of the most frequent chronic diseases in the population, ranking 3rd after cardiovascular diseases and diabetes mellitus [3.21]. In the countries of North America and Europe, HBS patients account for 15–25% of the population of these countries. In Asian and African states, it occurs much less frequently, in 3–6% of cases [1, 3, 7, 20].

Disturbances in the oral microbiocenosis, disturbances in the mechanisms of local immune protection, contributes the development of chronic inflammatory phenomen in periodontal tissues, which begins with an inflammatory process in the gum,in it the pathology of the gastrointestinal tract, in particular chronic cholecystitis is not excluded [9,10,11]. Dyskinesia of the gallbladder can lead to the development of chronic cholecystitis, when the inflammatory process develops in the gallbladder itself and is isolated in 6% of cases.

The problem of treating inflammatory periodontal diseases, in particular, chronic generalized catarrhal gingivitis on the background of chronic calculous cholecystitis is one of the most actual in dentistry. Treatment of gingivitis in this case is a complex task, aimed not only at eliminating inflammation in the gums, restoring lost function and homeostasis, but also at preventing

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complications of a destructive nature characteristic of periodontitis [4,5,12-17].

The object of the study is to increase the effectiveness of complex treatment of inflammatory periodontal diseases, combined with chronic cholecystitis by improving the tactics of diagnosis and treatment. To evaluate the effectiveness of the complex pathogenetic treatment, treatment of chronic catarrhal gingivitis in 97 patients with chronic generalized catarrhal gingivitis.

Material and research methods. The study was conducted from 2017 to 2018 at the Department of Hospital Therapeutic Dentistry of Tashkent State Dental Institute in 97 patients with chronic catarrhal gingivitis of varying degree of severity at the background of chronic cholecystitis. Patient consent was obtained for research.

The patients were divided into randomized groups by age and sex into the main group (61 persons), the comparison group (36 persons) and the control group (20 healthy individuals). The patients of the main group and the comparison group were divided into 3 subgroups according to the severity of catarrhal gingivitis. In the main group of 61 patients, the number of women was 35 (57.38 ± 6.33%), men - 26 (42.62 ± 6.33%), and the average age was 39.9. The number of patients in the comparison group was 36, of which women were 19 people (52.78 ± 8.32%), men –17 people (47.22 ± 8.32%), the average age was 39.7. The disease duration in the main group was 3.67; in the comparison group - 3,66.

In the main group and the comparison group patients received local and general treatment.

Patients with CGCG in the comparison group received traditional treatment consisting of applicational anesthesia with 2% lidocaine solution, they were treated with antiseptic 0.06% chlorhexidine solution, sanitation of the oral cavity, application of an antibacterial agent. General treatment in the comparison group consisted of an immunomodulating agent.

Local treatment of patients with CGCG of the main group was carried out according to the following scheme: after local applicational anesthesia with 2% lidocaine solution and antiseptic treatment of a 0.06% chlorhexidine solution; professional oral cavity sanitation was performed (removal of hard dental deposits with an ultrasonic scleler; polishing of the teeth necks with a brush and

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abrasive paste; floss was used to remove dental deposits from interdental spaces), then the gingival margin was irrigated with parodontax solution device Waterpik WP, application of an antibacterial preparatus (metrogil denta). Depending on the severity of chronic catarrhal gingivitis treatment lasted from 3 to 10 days (mild form: 3 days; medium-severe form: 7 days; severe form: 10 days).

The course of local treatment with irrigation of the parodontax rinse with the Waterpik apparatus was 3-10 days depending on the clinical condition of the gums, repeated examinations were performed after a week, 2 weeks, 3 months, 6 months and 12 months.

In parallel with the local treatment, together with the gastroenterologist, we developed a scheme of general pathogenetic treatment, which took into account the severity of the general pathogenetic mechanisms of development of chronic cholecystitis, on the background of which CGCG developed:

ursosan (hepatoprotector), rosalin (antibacterial drug), enterohermine (probiotic), enzyme (serrata), taktivin (immunostimulating drug), mexidol (antioxidant), tenoten (anxiolytic agent), borjomi (mineral water), diet.

For an objective assessment of the periodontal status of patients with chronic gingivitis, the oral hygiene index (OHI - S), Muhlemann bleeding index (SBI), papillary-marginal-alveolar index (PMA) were used. The biochemical research method was carried out to assess the degree of endogenous intoxication in patients with CHP associated with intrahepatic cholestasis based on a study of the level of medium molecular peptides, cytolytic enzymes and the level of malonic anhydride. The level of molecules of average mass (MAM) was investigated by the method of N.I. Gabrielyan (1984) in the ultraviolet range in the continuous scanning mode at wavelengths from 220 to 300 nm. The level of the average molecular pool for plasma was estimated by optical density. The activity of the prooxidant system was characterized by the level of malondialdehyde (according to the method of ID Steel and et al., 1997). The total activity of the enzymes - AST, GGT on the Mindray BA - 88 A automatic analyzer-the kits used were from HUMAN.

Statistical data processing was carried out by the method of variation statistics using Student's t-test. The results were processed using the STATISTICA program package.

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Results of the Study

During the initial dental examination, patients with CGCG complained of bad breath, a feeling of bitterness or a metallic taste in the mouth, itching, dryness, soreness, bleeding gums when brushing teeth, and taking hard food. An objective examination marked hyperemia, swelling of the gingival papillae and gingival margin, which leads to disturbance of the configuration of the gums. There are soft and hard dental deposits. When the periodontal probe touches the gum, bleeding of the gingival papillae appears. X-ray examination shows that changes in the compact plate, reduction of interdental septa, displacement of teeth and periodontal pockets are not observed.

Baseline OHI-s hygienic index in patients of the main group is 2.31 ± 0.22, in patients of the comparison group - 2.14 ± 0.31.

The baseline SBI in the main group was 2.14 ± 0.11 against 2.15 ± 0.12 in the comparison group. Baseline PMA in patients of the main group was 22.16 ± 1.64% against 20.42 ± 2.17% in the control group. The index value corresponds to the localization of inflammation in the gingival papillae.

Biochemical studies showed in patients with chronic generalized catarrhal gingivitis associated with the hepatobilar system disease, a significant increase in E254 molecular weight peptides was observed in 1.8 times when compared with the group of healthy individuals and in 1.5 times when compared with the group of patients with no pathology of the liver. Medium-molecular peptides detected at E280 wavelengths were also increased in patients with chronic generalized catarrhal gingivitis with a combined form of the disease in 1.6 times when compared with a group of healthy individuals, which indicates endogenous intoxication and an increase in blood plasma peptides of different mass, which is one of causes of cytokine-mediated damage to the hepatobiliary system of the liver. Liver damage caused by the activation of TNF-R-1 receptors observed as a result of endotoxemia, leads to activation of lysosomal hepatocyte enzymes and premature death of liver mitochondria. This condition is detected by the release into the blood stream of the mitochondrial enzyme - aspartate aminotransferase. As it is seen from the results of the research presented in the table, the activity of aspartate aminotransferase is significantly increased in patients with chronic generalized catarrhal gingivitis associated with HBS pathology on average 4 times when compared with healthy

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individuals. Involvement of hepatocytes into the pathological process of mitochondria is also accompanied by an increase in the activity of the mitochondrial enzyme-glutamate dehydrogenase in the blood of the examined individuals. The activity of the latter exceeded the initial level by an average of 2.3 times (P <0.05). Endogenous intoxication and activation of the cytokine system in case of combined pathology is accompanied not only by damage to the hepatocytes of the liver, but also affects the biliary function of the liver, i.e. synthesis and secretion, as well as the flow of bile at the level of the bile canaliculi due to the death of bile capillary cells and the release of enzymes into the blood plasma. To assess this condition, we studied the activity of the enzyme gammaglutamyltransferase and alkaline phosphatase. As it is seen from the obtained results of the research in patients with CGCG combined with HBS pathology, a significant increase in gammaglutamyltransferase activity was noted on average in 3.8 times (P <0.0.5). A similar dynamics is observed regarding the enzyme AP, whose activity in the blood plasma of the examined individuals is increased in 3.7 times when compared with healthy individuals.

Analysis of endotoxemia, enzyme systems and malonic anhydride in the blood plasma of patients with CGCG associated with HBS

Indicators	Healthy persons (n = 12)	Patients with CGCG associated with systemic disease HB n = 19	Patients with CGCG without pathology of HB system n = 17
The average molecular peptides E254	0.21 + 0.01	0.38 + 0.01 *	0.25 + 0.01
The average molecular peptides E280	0.30 + 0.01	0.49 + 0.03 *	0.36 + 0.02
Aspartate aminotransferase (ME / l)	16.11 + 0.57	64.89 + 4.18 *	27.08 + 2.11 *
Gammaglutamyltransferase (ME / l)	54.27 + 3.93	203.93 + 8.92*	73.41 + 5.92
Alkaline phosphatase (ME / l)	56.83 + 2.71	207.94 + 9.94*	76.93 + 5.03 *
Glutamate dehydrogenase (mMol / h / l)	15.42 + 0.91	35.18 + 3.21 *	19.65 + 1.67 *
Malonic dialdehyde (nMol / ml)	3.74 + 0.21	4.91 + 0.13 *	4.04 + 0.21

The analysis of the obtained results of the research, presented in the table, indicates an increase in the content of malonic aldehyde in the blood plasma of the examined individuals with a combined pathology on average in 1.3 times. The revealed changes in the studied parameters indicate a high sensitivity to

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the damaging effects of both cytokines and liver endotoxins, which, in turn, ensures their clearance.

Clinical observations confirm a decrease in PMA indices by an average of 1.86-2 times in a month of observation. In this regard, the anti-inflammatory efficiency of the PMA index averaged 72.2%. With the use of parodontax rinse in patients with chronic generalized catarrhal gingivitis, the gingival bleeding decreased by 1.5-2.0 times, the hemostatic effectiveness of bleeding index after a month of application of agents increased to 74.7%.

When using complex treatment, an improvement in oral hygiene was observed, which is confirmed by indicators of the hygiene index. The cleansing efficiency of the OHI-s index after a month application of use of agents averaged 50.5%, the OHI-s index decreased on average 2.5 times.

Blood biochemical indices showed that with the development of intrahepatic cholestasis in patients with CGCG there are signs of endogenous intoxication, manifested in increased oxidative modification of protein molecules, mainly including aromatic amino acids and possibly acquiring the properties of “toxins”, to which a large contribution is made by violation of intestinal microflora in patients with pathology of the hepatobiliary system, namely intrahepatic cholestasis (VPH). The latter is characteristic of this pathology and the results of the performed complex pathogenetic treatment showed that the content of SMP 254 decreases to 76.31% relative to the initial value. These pathologically modified compounds can have a cytotoxic and neurotoxic effect, participating in the development of immunosuppression, increased lipid peroxidation (POL) and damage to biomembranes, inhibition of enzyme activity and a number of other processes (tissue respiration, protein biosynthesis, erythropoiesis, etc.), leading to the development of tissue hypoxia, impaired humoral and nervous regulation. A similar dynamic was observed in the ratio of SMP 280, the value of which, prior to treatment, exceeded the initial level to 63%; after treatment, this value decreased to 73.46%. In patients with CGCG combined with HBS after the treatment there was a decrease in the activity of the enzymes - AST, HGT, ALP and HDH, respectively, to 38.18%, 49.68%, 49.31%, and 57.78% ($P < 0.05$).

Malonic dialdehyde (MDA) is an endogenous aldehyde resulting from the metabolism of arachidonic and other polyunsaturated fatty acids. As a result of

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further biochemical transformations, it is oxidized to carbon dioxide or interacts with phospholipids, amino acids and nucleic acids. Currently, malondialdehyde is considered as a marker of oxidative stress. In patients with chronic generalized catarrhal gingivitis, combined with the pathology of the hepatobiliary system, a decrease in the activity of MDA was also observed and amounted to 81.87% compared with baseline values before treatment ($P < 0.05$). Thus, after the treatment in patients CGCG with VPH, we observed a decrease in all the studied parameters as compared with the initial groups. At the same time, the indicators of SMP and enzymes were close to the initial values of healthy individuals.

Findings

1. The conducted clinical studies showed that the relief of the inflammatory process in periodontal tissues in patients of the main group occurred, as a rule, 5–6 days (on average 5.7 ± 0.13 days) after the start of rehabilitation activities, while comparison group in 10-12 days.
2. After the completion of the complex pathogenetic treatment using the irrigation of the gums with Parodontax with the WaterpikWP apparatus high results were obtained, in which the anti-inflammatory efficiency was determined as a reduction of the PMA index. The PMA value decreased from 22.16 ± 1.64% to 5.65 ± 0.05%, the OHI-s index decreased from 2.31 ± 0.22 to 0.19 ± 0.27; SBI 2.14 ± 0.11 decreased and amounted to 0.14 ± 0.11.
3. Analysis of endotoxemia, enzyme systems and malonic anhydride in the blood plasma of patients with CGCG, associated pathology of HBS after the complex pathogenetic treatment showed a decrease in all studied parameters compared with baseline groups, which confirms the results of clinical, instrumental and laboratory studies.

RECOMMENDATIONS

The results of the treatment proved the high efficiency of this complex of pathogenetic treatment of chronic generalized catarrhal gingivitis, which allows us to recommend this method for use in dental practice.

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