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*Research Article*

### ANALYSIS OF EFFECTIVENESS OF USE OF BIORESORBABLE PLATES ON THE BASIS OF COLLAGEN AND DIGESTASE FOR TREATMENT OF INFLAMMATORY DISEASES OF PARODENTIUM IN ADOLESCENTS

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**Abstract:**

*This article describes results of use of bioresorbable plates on the basis of collagen and digestase "Farmadont" as an anti-inflammatory drug being a part of a complex therapy for treatment of chronic generalized gingivitis in adolescents. Results of evaluation show a high effectiveness of use of the collagenic plates.*

**Keywords:** *gingivitis, collagen, digestase, plates "Farmadont", adolescents.*

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**INTRODUCTION:**

Inflammatory diseases of parodontium (IDP) are diagnosed in the whole population, irrespectively of age and socioeconomic status; these diseases are one of the most difficult and topical problems of dentistry. Prevalence of diseases of parodontium (according to data of the WHO) is very high; it is the highest in the age groups 15–19 years (55–89%) and 35–44 years (65–98%). Laboriousness and insufficient effectiveness of treatment, absence of a reliable system of prophylaxis result in the fact that inflammatory lesions of parodontium tissues lead to early loss of teeth. [1,2,7]

The following forms of pathologies are observed most often in adolescence from 10 to 19 years: anomalies of occlusion - 58%, abnormalities of rows of teeth - 25%, anomalies of individual teeth - 8%. Insufficient motivation for hygienic care for oral cavity and hormonal imbalance lead to high prevalence of inflammatory diseases of parodontium tissues and move this pathology into first place among all diseases of oral cavity in adolescents. The main pathology of parodontium tissues in this age group is catarrhal gingivitis. [4,5,8,10]

Inflammatory process, whose intensity increases with time, leads to deep morphologic and functional damages in tissues and organs that justifies the necessity of use of anti-inflammatory drugs. Anti-inflammatory drugs with systemic or local action are widely used in dental practice. [3,7,14,16]

Choice of methods and means of therapy of parodontium diseases depends to a great extent from a degree of manifestation of inflammatory process: painfulness, succulence, bleeding, depth of parodontal pocket. One of stages of local treatment of IDP is application of medicaments on marginal gingiva, introduction of them into parodontal pockets, smearing, and application of protective bandages. However, use of application preparations (pastes, gels, ointments etc.) is rather problematic because of physiological distinctive features of oral cavity where permanent inflow of saliva from salivary glands considerably reduces concentration of medicinal substances and often results in patients' discomfort. [4, 9,11,14]

In the last years the complex preparations are created in which biomaterials are combined with other medicinal substances. They have a wide spectrum of anti-inflammatory action due to their complex composition therefore they increase the effectiveness of therapy and the sphere of their use is widened.

Among these bio-compositions are bioresorbable collagenic plates "Farmadont", a complex preparation on the basis of collagen and extracts of medicinal plants. [3,5,6,12]

Use of collagen as a basis of pharmaceuticals is determined by its features: absence of toxic and cancerigenic properties, hydrophilism, ability to easily create complexes with many medicinal substances and ability to fully dissolve in organism. [13,15,16,12]

During treatment of diseases of parodontium it is important to avoid an expressed compression on underlying tissues. Bioresorbable phytoplates on the basis of collagen are preparation of choice in this case. They are easy to use and do not require certain skills for their application. While contacting with mucous tunic the plate begins to absorb saliva and to gradually turn into gel which secures that the medicinal substances are held exactly on the place of their application; this gel also protects the focus of inflammation from aggressive influence of environment. The plate gradually dissolves and releases active components, it needn't be removed. [13,15,17]

**Aim of our research** is to evaluate increase of effectiveness of use of bioresorbable plates on the basis of collagen and digestase for treatment of inflammatory diseases of parodontium in adolescents.

**MATERIAL AND METHODS**

We have conducted a clinical dental research in the hospital "Clinic of Doctor Agarkova"; this research included examination and treatment of patients having the diagnosis "chronic generalized gingivitis". The examined group included 30 adolescents aged from 10 to 19 years: 14 boys and 16 girls.

Criteria according to which the patients were included into the research:

1. Presence of a patient's written informed consent to participation in the research;
2. Age group 10-19 years;
3. Boys and girls;
4. Presence of inflammatory diseases of tunica mucosa oris;
5. Absence of sub- and decompensated accompanying pathology.

Criteria according to which the patients were not included into the research:

1. Inappropriate age group;
2. Pregnancy, breast-feeding;
3. Presence of sub- and decompensated accompanying pathology.

Criteria according to which the patients were excluded from the research:

1. Patient's refusal to further participate in the research;
2. Pregnancy;
3. A sub- and decompensated accompanying disease from which the patient had suffered earlier;
4. Violation of doctor's recommendations or stages of medical check-up.

Before start the patients were informed in detail about stages of the research, they were also informed about destination of preparations, which would be used, and they gave their informed consents.

All patients were divided into 2 groups of 15 persons according to use of studied medicaments: the main group and control one.

Complex therapy was conducted for patients of each group: supra- and subgingival dental deposits were thoroughly removed, marginal gingiva was antiseptized, the patients were taught to care for oral cavity, to control the quality of teeth cleaning and to individually select hygiene products.

After the above mentioned actions we used the collagenic plates "Farmadont" in the main group. Local treatment of patients of comparison group was provided by use of conventional anti-inflammatory medicinal dressings (ointment with 5% butadion, one with 3% indometacin, one with 10% methyluracil, "Levosin" or "Levomecol", heparin ointments, hydrocortisone ones, prednisolone ones), then the preparations were used, which stimulate angiogenesis (ointments "Solcoseryl", "Pantoderm").

For the purpose of diagnostics and objectivization of evaluation of anti-inflammatory effectiveness of applied medicaments we used the most indicative methods which reflect the patient's dental state such as measurement of index parameters (Fedorov-Volodkina index of hygiene of oral cavity, papillary-marginal-alveolar index (PMA), bleeding index SBI), we also used visual semiquantitative method of control of speed of healing of tunica mucosa oris damages, bacterioscopic examination of gingival sulcus contents.

Statistical treatment of research results was performed according to Student's method, the mean value (M), standard error (m) and difference

probability  $p$  were calculated (with generally accepted confidence level  $p < 0.5$ ).

## RESULTS AND DISCUSSION:

After analysis of medical effectiveness of studied preparations it was found out that the number of procedures, during which the stopping of inflammatory process in parodontium took place, varied according to severity of patients' state and intensity of inflammatory phenomena. Course of treatment lasted from 10 to 14 days.

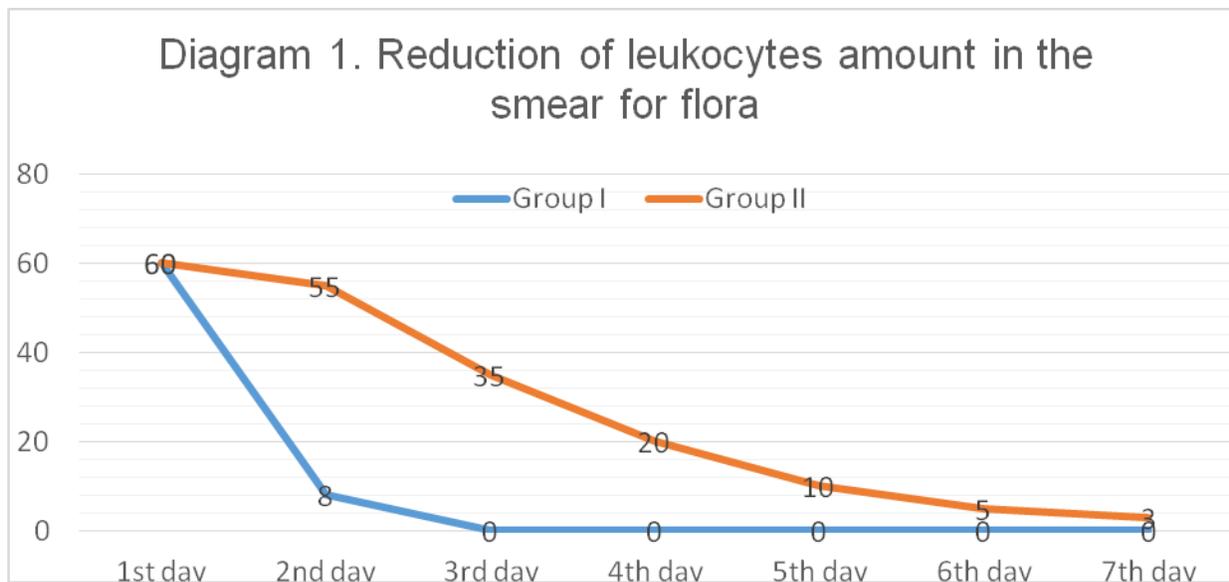
Patients also said that reduction of painful sensations in the control group took place at an average after 1-2 days, whereas painful sensations of main group patients, who received local treatment by the plates "Farmadont", disappeared immediately after the first application of the preparation.

After course of treatment of IDP had been completed, the improvement of the following indexes was observed in all patients of the main and control groups: index of hygiene, PMA, reduction of degree of bleeding. However, the anti-inflammatory effect was more pronounced and was got more quickly in patients for whom local treatment was performed by the plates "Farmadont": after 6-7 treatment sessions. Improvement of indexes is shown in the Table 1.

Absence of signs of inflammation was observed in 87% (13) patients of the main group that was confirmed by improvement of parodontal indexes, by determination of absence of inflammation through visual semiquantitative method of control of speed of healing of tunica mucosa oris damages, by considerable reduction of degree of loss of epithelial cover. Cytologic screening revealed a normal mitotic activity of epithelial cells and their sufficient maturity (nucleocytoplasmic ratio 1:3), and bacterioscopy revealed a practically full absence of pathogenic coccal and fungous flora. Residual effects remained in 13% (2) observed patients of the main group. However, a considerable improvement took place in them: practically complete elimination of succulence and slight staining at Schiller's test, that indicated a certain degree of normalization of metabolism. After a bacterioscopic examination had been performed, some separate coccal clusters and presence of sporadic elements *Candida* were discovered in the case when a partial inflammation of gingiva remained. Dynamics of reduction of leukocytes amount in the smear for flora is presented in Diagram 1.

**Table 1: Comparative assessment of hygienic indexes in patients.**

Index	Group			
	Main one	Control one	Main one	Control one
	Before treatment		After treatment	
Fedorov-Volodkina index of hygiene of oral cavity, point	2.5 ± 0.32	2.4 ± 0.41	1.3 ± 0.2	1.8 ± 0.2
PMA, %	35 ± 2.46	36 ± 2.24	5.5 ± 2.34	22 ± 2.46
SBI, %	24.8 ± 0.32	24.5 ± 0.94	12.8 ± 0.64	16.0 ± 0.48



Number of visits in the control group, whose patients received a conventional therapy, was 10–12. Absence of inflammation in this group was registered in 47% (7) cases, inflammatory phenomena were found in other patients in some parts of parodontium.

During research period, data of dental checks revealed no cases of local irritative and allergenic effect of the plates “Farmadont” on tunica mucosa of mouth.

Thus, determination of dental state of adolescents with inflammatory diseases of parodontium revealed that the clinical state of parodontium improved in patients of both groups due to the employed local treatment. However certain differences in some parameters were found which speak in favor of use of the plates “Farmadont”.

### CONCLUSION

1. Use of collagen as a basis of pharmaceuticals is determined by its features: absence of toxic and cancerigenic properties, hydrophilism, ability to

easily create complexes with many medicinal substances and ability to fully dissolve in organism.

2. Application of series of bioresorbable plates on the basis of collagen and digestase “Farmadont” in adolescents increases effectiveness of local treatment and prevention of inflammatory diseases of parodontium; this application is an integral part of etio-pathogenetic therapy. Use of these preparations during parodontal treatment secures a stable therapeutic effect in most cases and in shorter time in comparison with conventional preparations.

3. Combination of antibacterial, anti-inflammatory, wound healing, and anesthetic substances in the collagenic plates “Farmadont” secures a complex influence on IDP, that allows to use them in cases of acute processes and in cases of exacerbation of chronic processes in tissues of parodontium in adolescents.

4. During use of the plates “Farmadont” no cases of local irritative and allergenic effect on tunica mucosa of mouth of adolescents were revealed.

5. Method of introduction of active substances from the plates “Farmadont” is a promising trend in dentistry and deserves a special attention due to an accurate dosing of application over a long period.

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