

## DYNAMICS OF PERIODONTAL TISSUES MICROBIOCENOSIS UNDER THE COMPLEX TREATMENT OF CATARRHAL GINGIVITIS AND CHRONIC GASTRODUODENITIS IN THE ADOLESCENTS

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**Background.** *The key links in the etiology and pathogenesis of periodontal tissue diseases are the quantitative and qualitative changes in the composition of the microflora of oral cavity, with the simultaneous deterioration of oral hygiene, reduction of local and general immunity, which occurs more often in the presence of somatic diseases.*

**Objective.** *The aim of the research was to determine the clinical and microbiological efficacy of the developed treatment-prophylactic complex in the adolescents with catarrhal gingivitis and chronic gastroduodenitis before and after treatment.*

**Methods.** *Changes were made to and before the treatment of clinical parameters, gingival microbiocenosis of 38 adolescents with generalized catarrhal gingivitis and chronic gastroduodenitis aged 12-18 years old, who comprised the main group. In the comparison group 25 adolescents of similar age diagnosed with generalized catarrhal gingivitis without any somatic diseases were involved.*

**Results.** *It has been established that used combination (drug of plant origin with antimicrobial properties + dental gel with Metronidazole benzoate and Chlorhexidine digluconate + capsules of probiotics) yields the conventional treatment as well as exceeds it for examined clinical indicators and indexes. The treatment and prophylaxis with suggested complex have proved a significant positive effect on the gums microbiocenosis in adolescents with generalized catarrhal gingivitis and underlying concomitant gastroduodenitis.*

**Conclusions.** *The suggested therapeutic and prophylactic complex provides a reduction in the massiveness and colonization frequency of the gum mucosa by pathogenic aerobic microflora ( $\beta$ -hemolytic streptococcus, golden staphylococcus, and yeast-like Candida fungi).*

**KEY WORDS:** **catarrhal gingivitis; chronic gastroduodenitis; adolescents; microbiocenosis; complex treatment.**

### Introduction

Recent epidemiological studies prove a high intensity and prevalence of periodontal tissue diseases in childhood. According to many authors, children are mainly diagnosed with chronic catarrhal gingivitis, which prevalence reaches 90% [6, 13, 19, 20]. According to the contemporary concept, the development of periodontal tissue diseases is closely related to the microflora of the oral cavity, that is the reduction of the number of normal flora, the increase of conditionally pathogenic microorganisms, excessive indigestion and infection with periodontopathogens with simultaneous deterioration of oral hygiene, reduction of local and general immunity in the presence of somatic diseases are key links of etiology and

pathogenesis of the disease [1, 4, 11, 12, 16]. At the present time, the normophyll of the human body is considered to be a combination of microbiocenosis, which is part of a holistic system that performs the most important functions in the body: it is a supplier of biologically active substances, a powerful metabolic and detoxification body, it determines the formation of the overall immunological status of the organism and local immunity, and most importantly creates an anterior line of non-specific microorganism protection [3, 17, 22, 23]. The oral microbiome is one of the most complex and diverse microbial communities in the human body. In the development of dysbiosis disorders of the organism, conditionally pathogenic microbes prevail, among which are clones with medicinal resistance and genetic determinants that determine the virulence and pathogenicity of bacteria, but it is established that streptococci (representatives of normal flora) in the stage of primary inflammation of

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the gum are significant in the development of a pathological process, for example, the fixation of *P. gingivalis* and *P. intermedia* on the gum surface occurs after the appearance on these areas of *Streptococcus mitis* and *Streptococcus sanguis*, which contribute to attachment of parodontal microflora forming an intermediate layer between them and the outer membrane of epithelial cells [8, 14, 18].

The issue of creation of effective integrated treatment schemes is urgent, due to defeats in treatment, lack of a stable clinical effect, presence of relapses, resulting in a one-way approach to treatment without considering the features of the existing microflora, characteristics of local resistance and general condition of the organism [2, 10, 21].

The aim of the research was to determine the clinical and microbiological efficacy of the treatment and prophylactic complex aimed at correction of microbiocenosis of periodontal tissues in the adolescents with catarrhal gingivitis and chronic gastroduodenitis by clinical and microbiological monitoring before and after treatment.

### Methods

A clinical dental examination of 38 adolescents with generalized catarrhal gingivitis and chronic gastroduodenitis aged 12-18 years old, who comprised the main group, was conducted (group 1). In the comparison group, 25 adolescents of the same age diagnosed with generalized catarrhal gingivitis, who, at the time of the survey, had no complaints of violations of somatic health and were not on the dispensary records of related specialists, were involved (group 2). As a control, similar studies were performed in 20 adolescents of the same age without any signs of gum inflammation and somatic diseases.

Clinical examination of the adolescents was carried out according to the generally accepted technique using subjective and objective methods. The received data of each patient was entered in an outpatient documents of a dental patient and the record of our examination developed by us. At an objective dental examination of the patients, the depth of the pride of oral cavity and the features of the attachment of bridles, bite, tooth row and its integrity, the presence of seals and their condition were studied. Particular attention was paid to the condition of the gums: color (pale pink, hyperemia, cyanosis), relief of the gingival margin (exacerbation of the peaks of gingival papillae,

conical incision, swollen papillae) and consistency (normal tone, edema, pastiness), a kind of gingivitis, prevalence. The evaluation of the condition of gums around the tooth was carried out by sounding a periodontal probe. The index score was used to determine the initial state of periodontal tissues in the pre-existing groups and during monitoring after treatment. In order to assess the oral hygiene status, all patients were given the Simplified Oral Hygiene Index (Green-Vermillion, 1964), which allowed them to detect not an only plaque but also a tooth\_brush. To evaluate the inflammatory process in gums, the PMA index (papillary-marginal-alveolar index by C. Parma, 1960) was used. To establish the diagnosis and prognosis of the treatment of periodontal tissue diseases Papillary Bleeding Index (Saxer and Muhlemann, 1975) was used.

Simultaneously, microbiological studies were carried out on the contents of the tooth-asparagus furrow. A material for bacteriological examination for revealing of aerobic and extra-anaerobic microflora from the tooth-asparagus was conducted on tooth brushing, using a calibrated bacteriological loop No.1 on blood agar, Endo medium, and a potassium-iodine-starch indicative medium system (for identification of producers of hydrogen peroxide) and it was delivered to a microbiological laboratory within an hour. Plating was performed by the Gold method [9].

The seeds were incubated for 1 day at 37 °C under aerobic and anaerobic conditions (in a hermetically sealed desiccator) in an atmosphere enriched with CO<sub>2</sub>. The bacteriological examination was carried out in order to isolate pure cultures of microorganisms and their identification according to generally accepted microbiological methods for bacteria identification [5]. Identification of the isolated pure cultures was carried out by a complex of morphological, cultural and biochemical methods (STREPTOtest 16, STAPHYtest 16, Erba Lachema, Czech Republic). Quantitative records of colonies were conducted according to their species (or generic) affiliation. The results of the quantitative study of microflora were registered in colony-forming units, converted to 1.0 ml – CFU/ml, taking into account only those microorganisms which concentration in the specimen was not less than 1×10<sup>3</sup> CFU/ml. Based on the analysis of crop yields for each group, the population level PL (lg CFU/ml) and the Continuous Index (CI) [5] were determined.

Integrated therapy of GCG was carried out in accordance with the protocols approved by

the Order of the Ministry of Health of Ukraine No.566 dated 23.11.2004 "On Approval of Protocols for the Provision of Medical Aid to Children for the Specialty Pediatric Therapeutic Dentistry". The patients of the main group and the comparison group were divided into A and B subgroups according to treatment schemes. Patients of 1A and 2A subgroups were prescribed a combined herbal antimicrobial medicine in the form of paddling with 15% aqueous solution (about 10 ml of the preparation dissolved in ¼ cups of water) of the oral cavity 3-4 times a day, application to the gum mucosa and introduction into the interdental dentately gaps 2 times a day. Combined herbal antimicrobial medicine is a mixture of a mixture of chamomile flowers, oak bark, sage leaves, Arnica herbs, Ayer rhizomes, peppermint herbs, and Thyme grass. For general treatment, probiotics (capsules of Yogurt) were prescribed 1-2 capsules 3 times a day with a meal. For local treatment of the patients of 1B and 2B subgroups, irrigation of the gums was used with 0.05% chlorhexidine digluconate solution, herbs (chamomile, calendula) 3-4 times a day for 7 days, applications on the gum mucosa and insertion into the interdental gaps' ointment with mefenamic acid 2 times a day. The course lasted 10 days.

The data were expressed as the mean±standard error of the mean ( $M\pm m$ ). Probability values with  $p<0.05$  were considered statistically significant. The distribution of indices was estimated by using the Shapiro-Wilk Normality Test. The statistical significance of the differences between means was assessed by Student's T-criterion using Statistica 5.0 (Statsoft, USA).

The research was carried out in accordance with the principles of the Helsinki Declaration. The protocol of the study was approved by the Local Ethics Committee (LEC) of all institutions mentioned in the work. In accordance with the requirements of bioethics "On conducting laboratory research of biological material", written consent was received from the parents (guardians) of each child and the adolescents for the study of biomaterials.

### Results

According to the results of the clinical examination, the prevalence of catarrhal gingivitis in the adolescents of the main group was higher than in the comparison group, 69.8% versus 52.7%, respectively. The course of gingivitis in the patients of the main group in most cases was chronic or in the stage of aggravation, of

moderate severity, with the main complaint of bleeding gums. In the comparison group, mild chronic catarrhal gingivitis was predominantly diagnosed.

The PMA index evidenced that the degree of severity of gingivitis was higher in the adolescents of the main group –  $36.8\pm 1.21\%$ , which corresponds to the average severity of gingivitis,  $19.2\pm 1.07\%$  in the adolescents of the comparison group, which corresponds to mild gingivitis. The mean value of bleeding index was  $1.23\pm 0.01$  points in the main group and  $0.8\pm 0.01$  points in the comparison group.

The correlation between the level of oral hygiene and the prevalence of inflammatory events in periodontal tissues was defined. Analyzing the results of oral hygiene state, it was found that the average value of hygiene index in the adolescents of the main group and the comparison group was a satisfactory and unsatisfactory condition of the oral cavity. Thus, in the adolescents of the main group, the average index was  $1.76\pm 0.03$  points, in the comparison group –  $1.32\pm 0.03$  points. After the treatment, oral hygiene improved by  $0.31\pm 0.04$  points and  $0.17\pm 0.02$  points in the main and in the comparison group respectively, which corresponded to a good oral hygiene condition.

At the end of the course of complex treatment and elimination of clinical manifestations of the disease, the complaints in all adolescents were absent. Gums were pale pink, of a dense-elastic consistency, did not bleed when probing in the area of the tooth-spatula furrow. However, the adolescents of subgroups 1A and 2A, who received the suggested improved treatment, were more likely to have shortened treatment terms than the adolescent of subgroups 1B and 2B receiving traditional treatment.

During the treatment, all patients of the main group, as well as the comparison group, proved a positive dynamic of the studied parameters. Thus, the dynamics of the PMA index tended to reduce the signs of inflammation: the value of the PMA index after the end of treatment in the adolescents of the main group, subgroup 1A was  $3.7\pm 0.12\%$  and the subgroup 1B –  $6.8\pm 0.14\%$ . In the adolescents of the comparison group, subgroup 2A it was  $1.6\pm 0.08\%$  and the subgroup 2B –  $2.9\pm 0.13\%$ . A similar trend was evidenced in the study of the dynamics of the index of bleeding: the index after the end of the treatment course in the adolescents of the main group, subgroup 1A was  $0.11\pm 0.02$  points and the subgroup 1B –

0.17±0.03 points. In the adolescents of the comparison group, subgroup 2A it was 0.07±0.01 points and the subgroup 2B – 0.17±0.02 points.

However, in 6 months of monitoring, a slight worsening in clinical performance was evidenced in all groups, but in the adolescents of groups 1A and 2A, the increase in clinical indices was less significant than in the groups 1B and 2B. Thus, the PMA index for the adolescents of groups 1A and 2A in 6 months was 4.5±0.11% and 2.4±0.12% respectively, which was less than in the adolescents of groups 1B and 2B – 7.4±0.25% and 4.5±0.14% ( $p<0.01$ ), respectively. The abnormal pattern was evidenced in the study of the iodine of gums bleeding: in the adolescents of groups 1A and 2A in 6 months it was 0.23±0.01 points and 0.18±0.01 points, respectively, which was less than in the adolescents of groups 1B and 2B – 0.31±0.01 points and 0.27±0.01 points ( $p<0.01$ ), respectively.

The initial microbiological examination proved that, compared to the control group, in the adolescents with generalized catarrhal gingivitis, both in the context of gastroduodenitis and without concomitant pathology, a higher level of colonization of gum mucus by the representatives of resident  $\alpha$ -hemolytic streptococci ( $p<0.01$ ) and transient microflora of the oral cavity: epidermal staphylococcus ( $p<0.05$ ), stomatococcus ( $p<0.05$ ), and *Corynebacterium* (diphtheroids) ( $p<0.05$ ), was evidenced. In addition, the presence of active inflammatory process on the gum mucosa is accompanied by a significantly higher level of colonization of the affected areas by *Staphylococcus aureus* ( $p<0.05$ ),  $\beta$ -hemolytic streptococci ( $p<0.05$ ), and yeast-like fungi of the genus *Candida*. In this regard, a therapeutic and prophylactic complex aimed at correction of microbiocenosis of

periodontal tissues (patients of subgroups 1A and 2A) was developed. The effectiveness of the suggested complex was evaluated by a comparison of the dynamics of microbiological parameters with patients of subgroups 1B and 2B, who received protocol traditional treatment. By quantitative indicators of microbiocenosis of gum mucosa (population level and index of the constancy of different microorganisms), obtained during the initial examination before treatment, the comparable subgroups of patients (1A and 2A, 1B and 2B) practically did not differ.

The main representatives of the resident microflora of the oral cavity:  $\alpha$ -hemolytic streptococci were plated in all patients without exception in all periods of the monitoring. However, both therapeutic complexes demonstrated significant reducing the massiveness of colonization of gum mucus by  $\alpha$ -hemolytic streptococci (Fig. 1).

The most significant dynamics was evidenced after the treatment in the patients of subgroups 1A and 1B: population-level decreased by 6.43±0.15 lg CFU/ml to 4.72±0.13 lg CFU/ml ( $p<0.01$ ) and from 6.27±0.15 lg CFU/ml to 5.7±0.15 lg CFU/ml ( $p<0.01$ ), which corresponds to normal age indices in the control group without dental pathology. Significant positive dynamics was also evidenced in the patients of subgroup 2B (population level decreased from 5.05±0.26 lg CFU/ml to 4.23±0.13 lg CFU/ml,  $p<0.05$ ). However, in the latter case, PL  $\alpha$ -hemolytic streptococci dipped below the age standard (4.74±0.31 lg CFU/ml).

During a long-term after treatment period (in 6 months), the level of colonization of mucosal  $\alpha$ -hemolytic streptococci in subgroups 1B and 2A increased again ( $p<0.05$ ). The patients of the subgroup 1B did not experience any

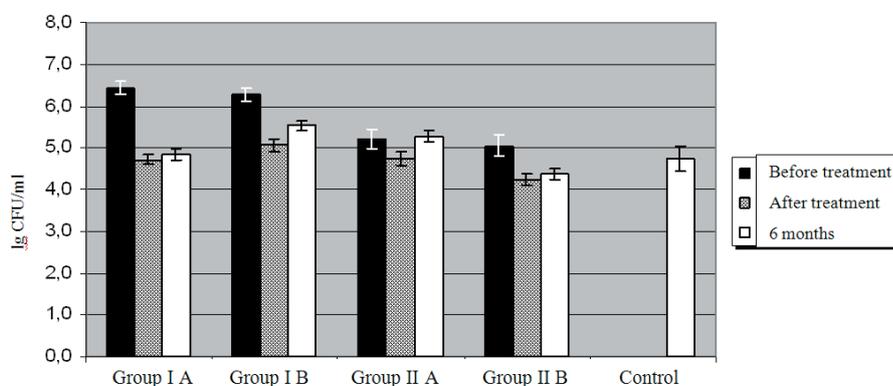


Fig. 1. Dynamics of population-level changes (PL) of  $\alpha$ -hemolytic streptococci on gingival mucosa of the adolescents with GKG in the use of various therapeutic complexes.

improvement; however, the  $\alpha$ -hemolytic streptococcal fraction was below the age standard. In the patients of the subgroup 1A (patients with ketal gingivitis and underlying gastro-duodenitis), the suggested therapeutic complex allowed achieving a stable normalization of this index (PL  $\alpha$ -hemolytic streptococci  $4.84 \pm 0.12$  lg CFU/ml,  $p < 0.01$  compared to the pre-treatment stage).

It should be noted that the suggested therapeutic complex also contributed to normalization of the species composition of  $\alpha$ -hemolytic streptococci on gingival mucosa of the adolescents followed up. Thus, before treatment of catarrhal gingivitis  $68.4 \pm 3.32\%$  of the patients of the main and  $64.0 \pm 3.43\%$  of the comparison group, *Streptococcus gordonii*, *Streptococcus sanguis*, *Streptococcus constellatus*, *Streptococcus anginosus* were isolated (which, in comparison with other  $\alpha$ -hemolytic streptococci, have wider sets of factors of virulence). The overwhelming majority ( $96.4 \pm 2.3\%$ ) of  $\alpha$ -hemolytic streptococci cultures from dermatologically healthy individuals were defined as *Streptococcus salivarius* and *Streptococcus mitis*. After the treatment, in the patients with scar tissue of subgroups 1A and 2A, the latter increased to  $84.6 \pm 3.2\%$  and  $76.5 \pm 3.9\%$  respectively.

In the patients treated for GCG in the traditional way (subgroups of 1B and 2B), there was a significant decrease in the massiveness of

colonization of gum mucosa by transient representatives of normal microflora of oral cavity: stomatococcus, non-series, and diphtheroids (Table 1). In the long term after treatment period (in 6 months), low population levels of these representatives of normophyll in the patients of the subgroups 1B and 2B were still present. At the same time, they were lower than the age norm, which may evidence a stable deficit of minor representatives of normal microbiocenosis of the oral cavity. The dynamics of changes in the index of constancy (plating frequency) of these microorganisms in the subgroup 2B was similar (Table 2).

On the contrary, the massive colonization of gum mucus by epidermal staphylococci in the treatment of the patients of subgroups 1B and 1B, on the contrary, proved a tendency to increase (Table 1). Nevertheless, the used therapeutic measures allowed achieving a short-term decrease in the frequency of plating *S. epidermidis* from the gum in these groups (Table 2).

The suggested new therapeutic complex, which included milder local action of antiseptic agents in combination with probiotics, proved a gentler normalizing effect on germ microbiocenosis. In the patients of subgroup 1A (GCG with underlying gastroduodenitis) immediately after the course of treatment and in 6 months, the rate of PR and IE representatives of transient microflora of oral cavity was close to normal age values (Tables 1 and 2).

**Table 1. The massiveness of gingival mucosa colonization with transient representatives of the oral cavity normal microflora (population level, lg CFU/ml) during treatment of the adolescents with GCG**

Patients subgroups		<i>S. epidermidis</i>	<i>Stomatococcus mucilaginosus</i>	<i>Neisseria sp.</i>	<i>Corynebacterium sp.</i>
Control		$3.78 \pm 0.21$	$3.39 \pm 0.08$	$3.57 \pm 0.22$	$3.00 \pm 0.05$
GCG+Gastroduodenitis					
1 A	Before treatment	$4.89 \pm 0.24$ †	$4.83 \pm 0.38$ †	$3.93 \pm 0.16$ †	$4.20 \pm 0.16$ †
	After treatment	$3.68 \pm 0.09$ *	$3.57 \pm 0.14$ *	$3.57 \pm 0.12$ *	$3.00 \pm 0.05$ *
	In 6 months	$3.89 \pm 0.24$ *	$3.68 \pm 0.15$ *	$3.50 \pm 0.13$ *	$3.47 \pm 0.09$ */†
1 B	Before treatment	$4.18 \pm 0.30$	$4.78 \pm 0.30$ †	$3.74 \pm 0.27$	$4.00 \pm 0.19$ †
	After treatment	$4.05 \pm 0.24$	$3.45 \pm 0.12$ *	$4.35 \pm 0.11$ */†	$3.00 \pm 0.05$ *
	In 6 months	$4.38 \pm 0.17$ †	$3.69 \pm 0.07$ *	$3.14 \pm 0.07$ */†	$3.50 \pm 0.16$ */†
GCG					
2 A	Before treatment	$3.43 \pm 0.15$	$4.03 \pm 0.13$ †	$4.13 \pm 0.27$ †	$3.85 \pm 0.06$ †
	After treatment	$3.43 \pm 0.24$	$3.73 \pm 0.11$ */†	$3.35 \pm 0.11$ *	$3.57 \pm 0.14$ †
	In 6 months	$3.60 \pm 0.17$	$3.83 \pm 0.04$ †	$3.35 \pm 0.14$ *	$3.60 \pm 0.12$ †
2 B	Before treatment	$3.94 \pm 0.27$	$4.76 \pm 0.27$ †	$3.85 \pm 0.35$	$3.80 \pm 0.25$ †
	After treatment	$3.90 \pm 0.25$	$3.57 \pm 0.15$ *	$3.00 \pm 0.05$ */†	$3.00 \pm 0.05$ *
	In 6 months	$4.02 \pm 0.12$	$3.73 \pm 0.11$ */†	$3.35 \pm 0.14$ *	$3.18 \pm 0.10$ *

Notes: \* –  $p < 0.05$  compared to the initial level in the corresponding subgroup (before treatment); † – compare to the control (dental-healthy adolescents without GIT comorbidity).

**Table 2. The frequency of plating of normal microflora transient representatives (continuous index, %) out of gingival mucosa of the adolescents with GCG during treatment**

Patients subgroups		<i>S. epidermidis</i>	<i>Stomatococcus mucilaginosus</i>	<i>Neisseria sp.</i>	<i>Corynebacterium sp.</i>
Control		30.0±3.3	45.0±3.6	15.0±2.6	10.0±2.1
GCG + Gastroduodenitis					
1 A	Before treatment	42.1±2.6 †	47.4±2.6	21.1±2.2 †	10.5±1.6
	After treatment	26.3±2.3 *	52.6±2.6 */†	15.8±1.9 *	5.3±1.2 */†
	In 6 months	42.1±2.6 †	47.4±2.6	21.1±2.2 †	15.8±1.9
1 B	Before treatment	63.2±2.5 †	57.9±2.6 †	26.3±2.3 †	21.1±2.2 †
	After treatment	42.1±2.6 */†	31.6±2.5 */†	10.5±1.6 *	10.5±1.6 *
	In 6 months	52.6±2.6 */†	42.1±2.6	26.3±2.3 †	10.5±1.6 *
GCG					
2 A	Before treatment	53.9±3.8 †	53.9±3.8 †	23.1±3.2 †	15.4±2.8
	After treatment	30.8±3.6 *	46.2±3.8 *	30.8±3.6 */†	23.1±3.2 */†
	In 6 months	61.5±3.7 */†	53.9±3.8 †	15.4±2.8 *	30.8±3.6 */†
2 B	Before treatment	41.7±4.1 †	50.0±4.2 †	16.7±3.1	25.0±3.6 †
	After treatment	25.0±3.6 *	25.0±3.6 */†	8.3±2.3 */†	8.3±2.3 *
	In 6 months	41.7±4.1 †	58.3±4.1 †	8.3±2.3 */†	33.3±3.9 */†

Notes: \* - p<0.05 compared to the initial level in the corresponding subgroup (before treatment); † - compare to the control (dental-healthy adolescents without GIT comorbidity).

In the patients of subgroups 1A and 2A, the new therapeutic complex allowed achieving a steady decrease in the massiveness and colonization frequency of gum mucosa by pathogenic aerobic microflora: *β-hemolytic streptococcus S. pyogenes*, *S. aureus*, golden staphylococcus, and *Candida* genus yeast fungi.

In the adolescents with GCG and underlying gastroduodenitis (subgroup 1A) immediately after treatment, the fact of a full disappearance of golden staphylococci from germ microbiocenosis was established. In six months after the treatment, it was revealed in only one patient (CI 5.3±1.2% with a minimum PL of 3.0 lg CFU/ml). At the same time, a significant decrease in *β-hemolytic streptococcus* gum (CI 10.5±1.6%, p<0.05) was also evidenced compared to the initial levels as well as in yeast-like fungi of genus *Candida* (CI 5.3±1.2%, p<0.05).

In the patients with GCG without concomitant gastroduodenal disease (subgroup 2A), the suggested therapeutic complex promoted to the disappearance of yeast fungus from gum mucus, but this event was not longlasting. In 6 months in 2 patients (5.4±2.3%) the colonization of gums by candidiasis was present again with an average PR 3.35±0.14 lg CFU/ml. In the subgroup 1B (GCG in combination with gastroduodenitis), the traditional therapeutic complex did not allow achieving a significant decrease in gonadal colonization rates by pathogenic microbiota.

## Discussion

The attained results of clinical examination of the adolescents of the main group, who underwent the suggested comprehensive treatment of catarrhal gingivitis, proved a more significant positive dynamics of the indices compared to the adolescent of the comparison group. Thus, the developed new therapeutic complex for treatment of adolescents with GCG and underlying concomitant gastroduodenitis proved a significant corrective effect on the nature of microbiocenosis gums. This allowed achieving a stable normalizing effect on the resident and transient normoflora and ensured a decrease in the proportion of pathogenic aerobic microorganisms in oral microbiocenoses of the examined adolescents.

The analysis of the conducted microbiological study prove that the microbiocenosis of gum mucus is caused by increased colonization by representatives of resident *α-hemolytic streptococci* (p<0.01) and transient microflora of oral cavity: *epidermal staphylococcus* (p<0.05), *stomatococcus* (p<0.05) and *corynebacteria* (*diphtheroids*) (p<0.05), and also is accompanied by a higher level of colonization of the affected areas by *Staphylococcus aureus* (p<0.05), *β-hemolytic streptococci* (p<0.05) and yeast-like fungi of the genus *Candida*, which confirms the established present concept of inflammatory diseases with underlying periodontal disease, which deals with the microbial factor triggering

inflammation in cases of periodontal disease, in children and adolescents [8,14].

Therefore, the detail study of the changes of microbiocenosis in adolescents, to be precise at the initial stage of inflammatory development, is urgent; much attention should be paid to the constant factors that may contribute to a long-term development of the disease with its transition to a more severe degree as well as occurrence of relapses. In addition, the results of microbiological examination can be a diagnostic criterion for the effectiveness of treatment and prognostication of the subsequent course of the inflammatory process in gums. The dynamics of clinical parameters and their changes in microbial associations in the course of treatment confirms the necessity of a repeated course of treatment for the adolescents with concomitant somatic pathology and underlying chronic gastroduodenitis, as well as without any somatic pathology, in order to obtain stable results and prevent recurrence.

The attained results are important for dental practice as well as for general pediatric practice, since the oral cavity is the initial part of gastrointestinal tract, periodontal tissues can be a reservoir for opportunistic and pathogenic microflora, and therefore cause not only periodontal tissue diseases but reinsert the lower sections of gastrointestinal tract and affect the course and results of treatment of common somatic diseases.

Consequently, the results prove the need for the development of the scheme of treatment and prophylactic complex of professional oral hygiene, hygiene training, monitoring the stable motivation to comply with individual oral hygiene in addition to drugs aimed at various pathogenesis links of the disease, as is also evidenced by other researchers [18].

### Conclusions

The attained results allow us drawing a conclusion that a high clinical efficacy of the suggested complex, which contributes to a prolonged positive dynamics and stable changes in periodontal tissues at the early period of treatment, which is confirmed by positive changes in the indexes.

The therapeutic and prophylactic complex for treatment of the adolescents with GCG has a steady corrective effect on normal gum microflora (the composition of  $\alpha$ -hemolytic streptococci, their quantitative characteristics of colonization, population level (PL) and index of constancy (Continuous Index, CI) stomatococci, non-toxic, and diptheroids).

The suggested treatment and prophylaxis complex reduce the massivity and colonization frequency of gum mucosa by pathogenic aerobic microflora ( $\beta$ -hemolytic streptococci, *Staphylococcus aureus*, and yeast-like fungi of genus *Candida*).

## ДИНАМІКА ЗМІН МІКРОБІОЦЕНОЗУ ТКАНИН ПАРОДОНТА ЗА УМОВ КОМПЛЕКСНОГО ЛІКУВАННЯ У ПІДЛІТКІВ З КАТАРАЛЬНИМ ГІНГІВІТОМ ТА ХРОНІЧНИМ ГАСТРОДУОДЕНІТОМ

І. С. Лісецька, М. М. Рожко, Р. В. Куцик

ІВАНО-ФРАНКІВСЬКИЙ НАЦІОНАЛЬНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ, ІВАНО-ФРАНКІВСЬК, УКРАЇНА

**Вступ.** Якісні та кількісні зміни мікрофлори, нехтування гігієною ротової порожнини та ослаблення місцевого і системного імунітету, які частіше зустрічаються на фоні соматичної патології, відіграють ключову роль у етіології та патогенезі захворювань тканин пародонту.

**Мета дослідження** встановити клінічну та мікробіологічну ефективність застосування запропонованого лікувально-профілактичного комплексу у підлітків з катаральним гінгівітом та хронічним гастроудоденітом.

**Методи.** Обстежено 38 підлітків віком 12-18 років з катаральним гінгівітом та хронічним гастроудоденітом (основна група). У групу порівняння включено 25 підлітків з катаральним гінгівітом без наявності супутньої соматичної патології.

**Результати.** Встановлено, що застосування запропонованої нами для лікування комбінації (засіб рослинного походження з антимікробними властивостями, застосування дентального гелю з метронідазолом та хлоргексидином разом з капсулами пробіотики) значно перевищує за своєю

ефективністю традиційні методи терапії. Відмічено значний позитивний вплив на показники мікробіоценозу тканини пародонту у з катаральним гінгівітом та хронічним гастродуоденітом.

**Висновки.** Запропонований лікувально-профілактичний комплекс значно зменшує колонізацію патогенної аеробної флори (Стрептокок групи В, золотистий стафілокок, гриби роду *Candida*) ротової порожнини.

**КЛЮЧОВІ СЛОВА:** катаральний гінгівіт; хронічний гастродуоденіт; підлітки; мікробіоценоз; лікувальний комплекс.

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