

Complex antihomotoxic therapy in children with gingivitis

Ludmila Gavriiliuc¹, Nina Sevcenco², Vadim Scoriatin³, Ana Vartician⁴, Pavel Godoroja⁵

Chisinau, Republic of Moldova

Summary

Gingivitis is an infectious disease with specific characteristics. Salivary indices (parameters) are a reflection of the patient's metabolic state and have clinical diagnostic importance in patients with oral tissue inflammation. The aim of our study was to examine the complex antihomotoxic therapy for children with mild gingivitis and to compare it with the traditional approach. The results of the study showed that the concentration of thiocyanate (SCN^- ions), reduce glutathione (GSH) decreased and protein content increased in the saliva of 12 years children with mild gingivitis. Complex therapy, including Traumeel S ointment and Coenzyme compositum, also as the traditional therapy ("Metrogyl-denta" gel) increased the salivary concentration of thiocyanate, GSH and decreased the content of protein in the patients with gingivitis. Complex therapy was a more effective treatment than the traditional one and decreased oral hygiene indexes (HI) and PMA indexes more considerably.

Key words: gingivitis, glutathione, PMA index, Traumeel S, Coenzyme compositum

Introduction

The oral cavity harbors a diverse, abundant and complex microbial community. Bacteria accumulate on both the hard and soft oral tissues in a sessile biofilm, engaging its host in an intricate cellular and molecular dialogue. This interaction normally leads to the constraint of bacterial growth, preserving the state of commensal harmony. Certain conditions, however, such as a compromised immune system, undermine this concurrent state. Under these circumstances, the oral microbiota becomes ultimately responsible for periodontal diseases like gingivitis, parodontitis, etc. Gingivitis is characterized by an increase in

the number and variety of inflammatory cells in the gingival surrounding the tooth root surface. [1] Inflammation of periodontium is a currently imperative problem in dentistry. The spread of gingivitis in children has increased to 30-65% of the population. Search for the newest and most effective methods of treatment of gingivitis at the early stage of the disease holds vital significance in modern dental practice.[2]

The antihomotoxic preparations Traumeel S ointment and Coenzyme compositum ("Heel", Germany) can be recommended for effectively targeting this problem. Traumeel S consists of 14 natural components, Coenzyme compositum – 26, which are the metabolites of Krebs cycle, the central meta-

¹ Professor of the Biochemistry and Clinical Biochemistry, Ph.D., M.D., Department of State University of Medicine and Pharmacy "Nicolae Testemițanu", Chisinau, Moldova.

² Assistant Professor, Department of Children Dentistry, State University of Medicine and Pharmacy "Nicolae Testemitanu, Chisinau, Moldova.

³ Doctor-dentist, liceul N 12 sector Ciocana, Chisinau, Moldova.

⁴ Assistant Professor, Department of Clinical Laboratory Diagnostics, State University of Medicine and Pharmacy "Nicolae Testemitanu", Chisinau, Moldova.

⁵ Professor, Chief of Children Dentistry Department, State University of Medicine and Pharmacy "Nicolae Testemitanu", Chisinau, Moldova.

bolic pathway of the human organism. These antihomotoxic preparations are homeopathic substances with protective, antioxidant, antitoxical and antiallergic properties.[3,4] Usage of these preparations is based on their composition, properties, action mechanism and possibility for use in oral application.

Salivary indices are a reflection of the patient's metabolic state and have clinico-diagnostical value in patients with oral tissues inflammation.[5,6]

The **aim** of this study was to examine the complex antihomotoxic therapy for children with mild gingivitis and to compare its action with a traditional approach.

Material and methods

The thirty-five children (12 years old) were examined. Selected children with mild gingivitis were divided in two groups: 1-patients treated traditionally, with conservative method ("Metrogyl-denta"gel); 2-patients treated with complex therapy (Traumeel S ointment and Coenzyme compositum). Twenty healthy children (12 years) consisted the control group. Antihomotoxic preparations Traumeel S and Coenzyme compositum were kindly placed at our disposal by the representative of "Homeofarm" company in the Republic of Moldova ("Heel" GmbH, Baden-Baden, Germany). The traditional preparation "Metrogyl-denta" gel and Traumeel S ointment with Coenzyme compositum (0,2 ml) was applied once a day (time of exposition 30 min) for a period of 7 days. The clinical effects were estimated with help of Green Vermilion, PMA indexes and Pisarev-Shiller test. Saliva (mouth liquid) was collected in the morning and centrifuged at 600 g for 10 min. After centrifugation saliva was examined using SP "Humalyzer 2000" (Germany). In saliva were determined the content of protein [7], thiocyanate [8] and reduce glutathione (GSH)[9]. The salivary parameters

(indices) examined two times during treatment: before the therapy process and on the 8th day of therapeutical course (end of treatment). The results were statically analyzed with Student's method and Microstat: Microsoft Excel 98 program. Spirmean's method of nonparametric correlation was used for examination of interrelation between the salivary parameters and indexes.[10]

Results

The **clinical effect** resulted in a decrease in symptoms (hyperemia, infiltration, pain) in children with gingivitis treated by complex therapy with antihomotoxic preparations and traditionally. No side effects were observed. The positive effect of treatment became evident when patients treated with the complex therapy displayed a significant decrease in symptoms as early as on the 3rd-4th day of treatment. The results of oral hygiene index (HI) for the control group was 0.5; PMA – 1.3%. We can see, that PMA decreased in 3 times after traditional therapy, and in 4.5 times after complex therapy. In first group of patients on the 8th day of complex treatment HI decreased from 1.64 to 0.5; PMA – from 22.92% to 7.1%. (*Figure 1*) In second group of patients on the 8th day of complex therapy HI decreased from 1.18 to 0.24; PMA – from 21.12% to 4.67%. The results of Shiller-Pisarev index (SPI) for the healthy children were 0-0.1. Before the starting of traditional therapy in the children with gingivitis SP index was 1.64. In 7 days of the treatment this index was 0.5 (in 3 times smaller). SP index in patients treated with complex therapy was 1.18 and decreased to 0.24 (in 5 times lower).

The results of **thiocyanate** concentration in the saliva of the patients with gingivitis at the first examination before treatment showed a decrease to 1.295 mmol/L (63.9%; $P_t < 0.05$) or 0.958 mmol/g (57.9%; $P_t < 0.05$)

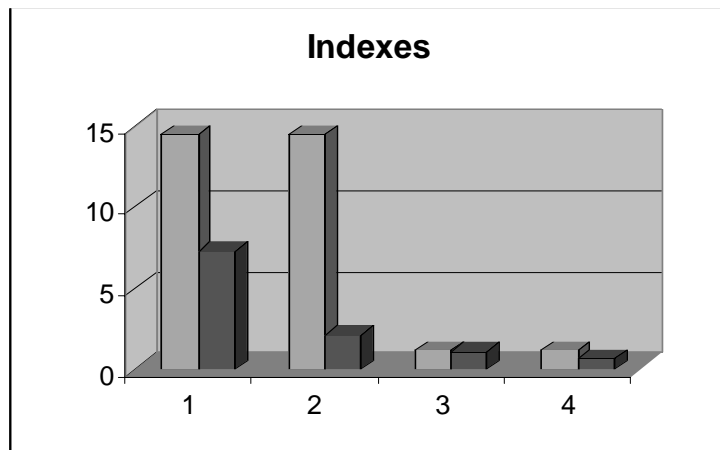


Figure 1. Impact of traditional and complex therapy on PMA and HI in children with gingivitis
1,2-PMA; 3,4-HI. 1,3- traditional therapy; 2,4- complex therapy.
The first column-before treatment; the second column - 8th day.

Table 1. Impact traditional and complex therapy on salivary parameters in children with gingivitis

Parameters	Healthy	Before traditional therapy	After traditional therapy	Before complex therapy	After complex therapy
Protein (g/L)	1.224	1.351	1.219	1.239	1.109
SCN,mmol/L	2.027	1.295*	1.223*	1.646*	1.360*
mmol/g	1.656	0.958*	1.000*	1.385*	1.326*
GSH,mmol/L	0.175	0.151	0.150	0.149*	0.152
mmol/g	0.143	0.112*	0.123*	0.126*	0.146

*- $P_t < 0.05$

in comparison with control group (2.027 mmol/L; 1.656 mmol/g). (Table 1.) The results of thiocyanate concentration in the saliva of second group patients showed 1.646 mmol/L (81.2%; $P_t < 0.05$) and 1.385 mmol/g (83.6%; $P_t < 0.05$). On the 8th day of the traditional therapy thiocyanate content didn't change (60.3% per liter and 60.4% per g of protein). Complex therapy decreased thiocyanate content to 1.360 mmol/L (67.1%; $P_t < 0.05$), and insignificantly to 1.326 mmol/g (80.1%; $P_t < 0.05$).

Determination the salivary **reduce glutathione** concentration in first group patients with gingivitis before treatment (Table 1) showed a decrease to 0.151 mmol/L (86.3%; $P_t > 0.05$) or 0.112 mmol/g (78.3%; $P_t < 0.05$) as compared to healthy

subjects (0.175 mmol/L; 0.143 mmol/g). In the saliva of second group patients with gingivitis the concentration of reduce glutathione also was decreased. In a week the traditional therapy increased GSH content insignificantly to 0.123 mmol/g (86.0%; $P_t > 0.05$), whereas no difference was found in calculation per liter of saliva. Complex therapy increased the GSH concentration to 0.152 mmol/L (86.9%; $P_t > 0.05$) and more considerable to 0.146 mmol/g (102.1%; $P_t > 0.05$).

Protein content in patients' saliva of both groups showed increase to 1.351 g/L (110.4%, first group) and 1.239 g/L (101.2%, second group). (Table 1) On the 8th day the traditional therapy decreased salivary protein content in first group to

Table 2 Interrelation between clinical and biochemical parameters in children with gingivitis

Parameters	Coefficient (r)	P value
PMA – GSH a)	+ 0.767	< 0.01*
b)	+ 0.612	< 0.05*
c)	+ 0.586	< 0.05*
PMA – SCN a)	+ 0.354	> 0.05
b)	+ 0.309	> 0.05
c)	+ 0.870	< 0.05*

a) before treatment; b) traditional therapy; c) complex therapy.

1.219 g/L (99.6%) in comparison with control group (1.224 g/L). In a week the salivary protein content in second group patients was 1.109 g/L.

Correlation analysis. Another approach was a correlation analysis between the salivary biochemical parameters (components) and clinical characteristics (indexes) in children with gingivitis during therapy courses. (Table 2) Correlation Spirmean nonparametric analysis indicated a positive interrelation between the reduce glutathione concentration and PMA before treatment and after end of both therapeutic courses. A strong positive correlation between PMA and the SCN ions concentration was indicated after complex therapy only.

Discussion

Inflammation process, accompanying gingivitis, led to the metabolic imbalance of salivary parameters. Inflammation is an activating factor for peroxide oxidation of lipids (POL) in periodontal tissues and metabolic disturbances. Glutathione is the main component of redox-buffer of the intracellular medium. Concentration of GSH into the cell is about 90% of all thiols disulfides.[11] Glutathione is water-soluble antioxidant, which participates in detoxication. Our results demonstrated the more considerable increasing of the salivary GSH

content in children with gingivitis treated complex therapy.

Saliva contains many substances with bacteriostatic characteristics. For example, lactoperoxidase (LP) catalyzes thiocyanate (SCN) oxidation in presence of hydrogen peroxide (H_2O_2) to hypothiocyanite (OSCN) with more intensive bacteriostatic properties. This system (LP- H_2O_2 -SCN) is more effective than the action of H_2O_2 as an inhibitor for bacteria. [12] Before the therapeutic courses the thiocyanate concentration in the saliva of children with gingivitis was decreased. Complex therapy increased the thiocyanate concentration more significantly than traditional course.

Conclusion

Complex therapy, which included two antihomotoxic preparations, Traumeel S ointment and Coenzyme compositum, was more effective than the traditional one. This fact was confirmed by the dynamics of indexes (HI, PMA, SP) and the salivary concentration of reduce glutathione (GSH), thiocyanate (SCN) and protein content in the children with gingivitis during treatment, more effective the reduction of inflammation period and positive improvement of patients' health status. Based on our results, complex antihomotoxic therapy proved to be a more effective treatment of gingivitis at the early stage of the disease.

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Corresponding Author: Ludmila Gavriluc – Professor of the Biochemistry and Clinical Biochemistry Department of State University of Medicine and Pharmacy “Nicolae Testemisanu”, (doctor habilitat în medicină), Ph.D., M.D. – **Address:** Bdul Ștefan cel Mare 165, Chisinau, Moldova, MD 2004. e-mail: gavrlu@mail.md