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Tetiana Pavliuk
Postgraduate student of Dentistry Department, Ivano-Frankivsk National Medical University, 2Halytska str, Ivano-Frankivsk, 76018, Ukraine

Corresponding Author:
Tetiana Pavliuk
Postgraduate student of Dentistry Department, Ivano-Frankivsk National Medical University, 2Halytska str, Ivano-Frankivsk, 76018, Ukraine

Metabolic disorders correction of initial-I stage generalized periodontitis that appear as a result of increased emotional sensitivity level among undergraduate students

Tetiana Pavliuk

Abstract
The purpose of the study was to analyze the long-term results of the nootropic pill "Noofen" use efficiency in the complex treatment of initial-I stage generalized periodontitis among 2nd year medical university students with increased level of emotional sensitivity.
Materials and Methods: 60 students with initial-I stage generalized periodontitis and increased and high levels of emotional sensitivity were observed. Clinical indices PMA, PI, BI, OHI-S and the level of MDA, SOD, and GPO in saliva were detected.
Results: The oral hygiene state, clinical indices PMA, PI, BI, and the Green-Vermillion Index and the level of MDA, SOD and GPO was improved after treatment in both groups (p<0.001), however in 12 months after treatment the results in group I was better, where advanced treatment was performed than in group II, that is confirmed statistically (p<0.001).
Conclusion: The results of the treatment indicate that the use of the advanced treatment of GP is significantly more effective, which is confirmed by the positive clinical trials and positive changes in oral fluid biochemical parameters.

Keywords: Generalized periodontitis; prooxidant-antioxidant system; oxidative stress; students

Introduction
Periodontal tissue disease, namely generalized periodontitis (GP), is an actual problem in modern dentistry. The prevalence of this disease among 35 years and older people reaches 92-98%, and among young people (18-25 years), the main part of which are students, reaches 30% and tends to increase [1, 2, 3].
The main etiological factors in the occurrence of dystrophic-inflammatory periodontal tissues diseases are microorganisms of dental biofilm [4]. However, these microorganisms become active as a result of immune system weakness. Factors such as stress, anxiety, and depression are risk factors for various diseases, including generalized periodontitis [4, 5]. Experimental and clinical studies show that increased emotional sensitivity affects the metabolic and physiological processes of human body organs and systems, in particular periodontal tissues, which leads to the occurrence of inflammatory-dystrophic changes [6, 7, 8, 9].
"Noofen" is one of the pill that eliminates heightened emotional sensitivity, namely anxiety, and has a positive effect in the treatment of GP. That is why in the advanced complex treatment of initial-I stage generalized periodontitis we used this pills.

The purpose of the study
To analyze the long-term results of the nootropic pill "Noofen" use efficiency in the complex treatment of initial-I stage generalized periodontitis among 2nd year medical university students with increased level of emotional sensitivity.

Materials and Methods
To determine the efficiensy of advansed complex treatment, we conducted a clinical and laboratory examination and treatment 60 students with initial-I stage generalized periodontitis and increased and high levels of emotional sensitivity. The students were divided into two groups, depending on the performed treatment: main (30 people) and comparison group (30 people).

The students of the main (first) group received advanced treatment, which included local treatment – oral rinsing with "Oktenisept" solution and dissolving of pill "Lizak". For general treatment, patients in this group received the nootropic pill "Noofen". Students of II group received conventional treatment according to a dental care protocol, which for local treatment included rinsing the mouth with 0.05% chlorhexidine solution and dissolving the "Lisobact" pill. Patients in both groups received the vitamin-trace element complex "Vita-Supradin Active".

For diagnosis, generalized periodontitis of initial-I stage data from objective examination, clinical indices PMA (papillary-marginal-alveolar index), PI (periodontal Ramfjord index), BI (bleeding index of the gums by S. samh HR, Soon, modified by I. Cowell), and the Green-Vermillion Index (OHI-S) were used. The diagnosis of periodontal disease was established using the classification of M.F. Danilevsky [2].

To evaluate the condition of periodontal tissues prooxidant-antioxidant system, a study of the oral fluid was performed that was taken in the morning. The condition of the oral prooxidant system was determined by the level of malondialdehyde (MDA). To study the status of the antioxidant protection system, the activity of superoxide dismutase (SOD) and glutathione peroxidase (GPO) was determined [10, 11, 12].

Clinical and laboratory examination was performed before treatment, immediately after treatment, at 1 month, 6 months, and 12 months.

The obtained results were processed using the statistical package "Stat Soft 6.0", classical methods of variational statistics. The presence of differences between the studied indicators was assessed by Student's test.

Results and Discussion

As a result of the complex treatment, we observed a significant improvement in periodontal tissues condition in both groups. The gums turned pale pink, dense and did not bleed. Students pointed to an improvement in overall well-being, a decrease of bad breath manifestation.

Analyzing the oral hygiene state (Figure 1), we observed sagnificant improvement after treatment in both groups (p<0.001). Indicators in both groups did not differ immediately after treatment and were 0.43±0.04 points in group I and 0.6±0.04 points in group II (p>0.05). However, analyzing long-term time in both groups, we observed more stable results in 12 months after treatment in group I (0.84±0.04 points), where advanced treatment was performed than in group II (1.19±0.04 score), that is confirmed statistically (p<0.001).

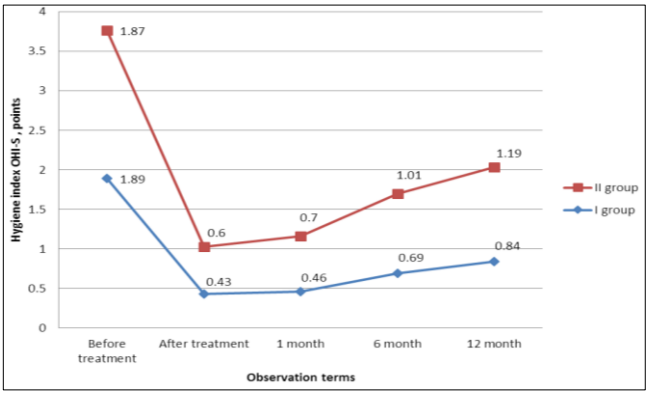

Fig 1: Dynamics of hygiene index changes during treatment stages

After treatment, the level of gum inflammation in both groups was decreased, as indicated by the value of PMA (Figure 2) in the main group and comparison group. Thus, in patients of group I, this indicator decreased from 36.15±1.7% to 4.32±0.87% (p<0.001). In the comparison group, PMA decreased from 34.9±1.57% to 4.65±0.91% (p<0.001). Although the results of this indicator after treatment were not statistically different (p>0.05), but in the long term after the treatment (1 month, 6 months, 12 months), the main group results, where improved treatment was used, was significantly better (p<0.001).

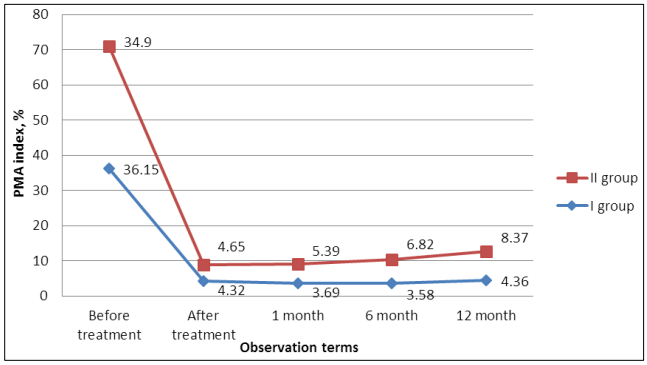

Fig 2: Dynamics of papillary-marginal-alveolar index changes during treatment stages

As a result of the complex treatment, the bleeding of the gums also decreased, as indicated by BI (Figure 3). In I group, this indicator from 1.65±0.09 points before treatment decreased to 0.07±0.02 points, and in II group from 1.61±0.1 points to 0.23±0.02 points. In main group patients, this result was better and statistically different from the group II indicator (p<0.001). With regard to long terms after treatment, it should be noted that data in I group were more stable than in group II. In 12 months after treatment, BI in group I was 0.2±0.03 points and in II group 0.96±0.04 points, which indicated more efficient treatment in group I (p<0.001).

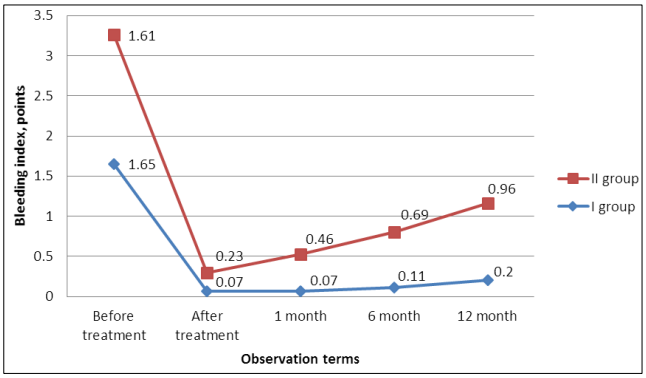

Fig 3: Dynamics of bleeding index changes during treatment stages

Changes in the periodontal index indicate the periodontal tissues condition at the treatment stages (Figure 4). Thus, after treatment, this indicator decreased in both groups. However, long-term treatment results indicated that the PI in I group was significantly better and was 2.52±0.04 points relative to II group, where this index was 2.91±0.05 points (p<0.001)

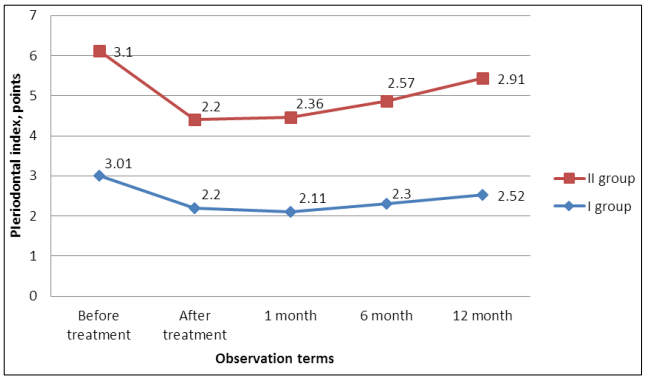

Fig 4: Dynamics of periodontal index changes during treatment stages

The prooxidant-antioxidant system of the oral fluid is also notice periodontal tissue improvement. Thus, the MDA level (Figure 5) in both groups significantly improved after treatment, and were 0.21±0.01 nmol/ml and 0.24±0.02 nmol/ml, respectively, in I and II groups. In the long term, after the treatment, the indicator level in group I was more stable compared to II group, and after 12 months was 0.49±0.03 nmol / ml, which was much better than in II group – 0.88±0.03 nmol/ml (p<0.001).

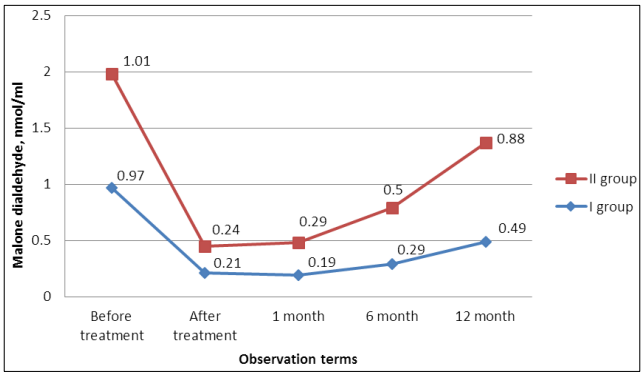

Fig 5: Dynamics of malone dialdehyde index changes during treatment stages

Analyzing the indicator of antioxidant system, it should be noted that they also improve after treatment. Thus, the value of SOD (Figure 6) in the oral fluid of I and II groups increased from 19±0.54% and 19.78±0.57% to 64.7±2.5% and 62.07±2, 85%, respectively (p<0.001). Regarding the values of this indicator in the long term, it was statistically better in group I compared to group II (p<0.001).

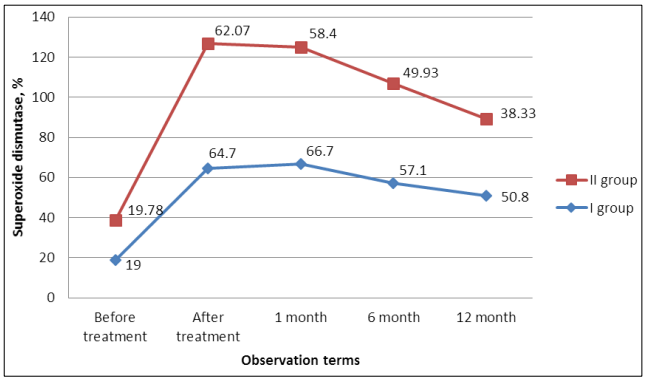

Fig 6: Dynamics of superoxide dismutase index changes during treatment stages

The improvement of the antioxidant system of the oral fluid is also observed by changes in the GPO index (Figure 7). The value of this indicator improved after treatment in groups I and II from 0.19±0.01 μmol/min*mg and 0.18±0.01 μmol/min*mg to 0.63±0.02 μmol/min*mg and 0.6±0.01 μmol/min*mg, respectively (p<0.001). In the long term group I indicators were more stable compared to group II, and within a year after treatment were 0.42±0.02 μmol/min*mg in group I and 0.31±0.01 μmol/min*mg in group II, which was statistically confirmed (p<0.001).

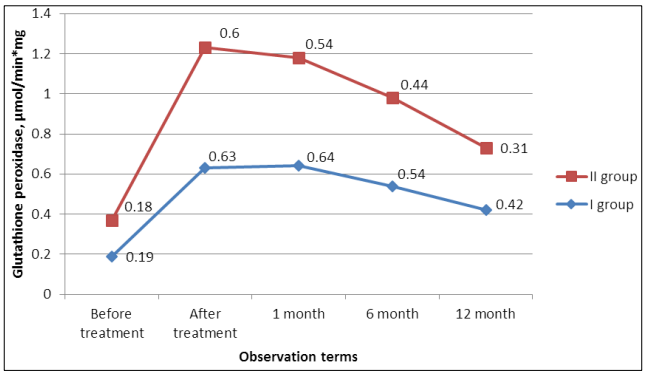

Fig 7: Dynamics of glutathione peroxidase index changes during treatment stages

Conclusion

As a result of the advanced treatment of GP, which included nootropic pills "Noofen", in complex treatment of GP among 2 year medical university students with high level of emotional sensitivity is turned out as effective, which is confirmed by positive clinical studies indicators and positive biochemical indicators changes. The periodontal tissues and prooxidant-antioxidant system indicators of I group, where advanced treatment was performed, were more stable and better in the long term compared with II group (p <0.001), where conventional therapy was used.

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