V.M. Dvornyk, O.I. Roshchuk[1], O.B. Belikov[1], V.P. Havaleshko[1], Ya.R. Karavan[1], O.S. Khukhlina[1]
Poltava State Medical University, Poltava
[1]Bukovinian State Medical University, Chernivtsi

FEATURES OF THE CLINICAL COURSE OF PERIODONTAL DISEASES IN PATIENTS WITH GASTRIC AND DUODENAL ULCER WITH FIXED DENTURES

e-mail: belikovsasha@ukr.net

The examination of periodontal tissues in patients with gastric and duodenal ulcers with the presence of fixed dentures has been studied. The purpose of the study was to establish the frequency and features of the clinical course of periodontal disease at the presence of fixed dentures. It was established that the prevalence of periodontal disease in patients with gastric and duodenal ulcers without dental prosthetics is determined in 86.2 % of people, and at the presence of fixed dentures – in 100 % of people. The highest number of cases of chronic generalized periodontitis of I and II degree of severity was found in the group of patients with fixed metal dentures (60.0% and 29.2% of people, respectively), which was in 1.6 times and 2.6 times respectively higher in patients with fixed ceramic dentures (p<0.05).

Keywords: periodontal disease, gingivitis, gastric and duodenal ulcer, fixed metal dentures, ceramic dentures.

В.М. Дворник, О.І. Рощук, О.Б. Бєліков, В.П. Гавалешко, Я.Р. Караван, О.І. Хухліна
ОСОБЛИВОСТІ КЛІНІЧНОГО ПЕРЕБІГУ ЗАХВОРЮВАНЬ ТКАНИН ПАРОДОНТА У ПАЦІЄНТІВ З ВИРАЗКОВОЮ ХВОРОБОЮ ШЛУНКА ТА ДВАНАДЦЯТИПАЛОЇ КИШКИ ІЗ НЕЗНІМНИМИ ЗУБНИМИ ПРОТЕЗАМИ

Проведено дослідження стану тканин пародонта у пацієнтів із виразковою хворобою шлунка та дванадцятипалої кишки за умов користування незнімними зубними протезами. Метою нашої роботи було встановити частоту виникнення та особливості клінічного перебігу захворювань тканин пародонта при наявності незнімних зубних протезів. Встановлено, що поширеність захворювання пародонта у хворих на виразкову хворобу шлунка та дванадцятипалої кишки без зубного протезування визначаються у 86,2 % осіб, а за наявності незнімних протезів – у 100 % осіб. Найбільша кількість випадків хронічного генералізованого пародонтиту I та II ступеня тяжкості виявлено в групі хворих з незнімними металевими зубними протезами (у 60,0 % та 29,2 % осіб відповідно), що в 1,6 рази та 2,6 рази відповідно було вищим показників у хворих із незнімними керамічними протезами (p<0,05).

Ключові слова: пародонтит, гінгівіт, виразкова хвороба шлунка та ДПК, незнімні металеві зубні протези, керамічні зубні протези.

The increase in the incidence of gastric and duodenal ulcers (GDU) and periodontal disease, which has been observed in the last decade, is due to the syndrome of mutual burdening of these pathologies [3]. Periodontal disease is diagnosed in 92–100 % of patients with GDU, and mainly occur in the form of generalized periodontitis [1, 3]. The leading factors of this syntopia are: microbiocenosis, immunological and neuroregulatory disorders, changes in connective tissue metabolism, hemodynamics and mineral metabolism [5]. Digestive pathology precedes the appearance of changes in the periodontium, and aggravation of chronic periodontitis occurs during the aggravation of the underlying disease [2].

Patients with this comorbid pathology often need rational prosthetics, because tooth loss at periodontitis is observed in 4-6 times more often than at caries and its complications [4]. At the same time, the researchers concluded that patients with dentures have a higher risk of further tooth loss than patients without them, even with long-term maintenance of periodontal therapy [2]. Also, rational prosthetics should include the meticulous planning with determination of the shape, dimensions and thickness of the alveolar ridge in the edentulous spaces [12].

At the same time, materials used for dental prosthetics are not always indifferent to both periodontal tissues and digestive system [2, 11]. The problem is that in Ukraine even 10 years ago were actively used fixed metal dentures in the prosthetic treatment of patients, while the literature indicates a significant increase in the frequency of adverse effects of these constructions on periodontal tissues [2]. Many authors consider metal-containing dentures as a trigger in the pathogenesis of periodontal disease [7, 8]. Oral cavity tissues, which contact with metals, have suppressed regeneration processes, healing time is prolonged [9], which clearly complicates the treatment of periodontal disease.

For high-quality dental care and prosthetics of patients, a careful study of the periodontal tissues conditions is necessary as well, as the therapeutic control of the underlying gastrointestinal disease.

However, a study of periodontal status of patients with dentures, made of different structural materials, and the underlying GDU is still poorly described in the literature, what determines the relevance of this problem.

The purpose of the study was to evaluate the condition of periodontal tissues in patients with peptic ulcer of the stomach and duodenum, to establish the frequency and features of the clinical picture of periodontal disease at the presence of fixed dentures.

Materials and methods. 177 patients with GDU in the aggravation phase of varying severity were examined, including: 134 patients were with fixed dentures and 43 persons – without dentures. Patients were divided into 4 groups depending on the presence and construction material of dentures: the 1st group consisted of 43 people without dentures, the 2nd group consisted of 65 people who had fixed metal dentures: stamped-brazed and solid constructions, the 3rd group – 42 patients with fixed metal-ceramic dentures, and the 4th group – 27 people with fixed ceramic dentures, made of press ceramics and ceramics on a zirconium dioxide frame. Patients were previously prosthetized in dental institutions of Chernivtsi region (Ukraine). There were 56 women and 121 men aged from 35 to 55 years (mean age 44.7±1.15 years). The control group consisted of 20 healthy individuals of the appropriate age.

The diagnosis of periodontal tissue diseases was carried out according to the classification of M.F. Danulevskyj (1994). Assessment of the bone tissue of the jaws was performed using orthopantomography.

The intensity of the inflammatory reaction in the gums was evaluated by index PMA (Parma, 1960). For determination of the need for treatment of periodontal disease was used Community Periodontal Index of Treatment Needs (WHO, 1989). The depth of periodontal pockets was measured with a graduated probe with a blunt end on 4 sides along the axis of the tooth. Sulcus Bleeding Index (SBI) by H.R. Mühlemann, A.S. Mazor (1958) investigated using a button probe, the assessment was performed by Mühlemann and Son (1971). The hygienic condition of the oral cavity was evaluated with OHI-S (Greene J., Vermillion J., 1964).

All studies were performed after patients have signed an informed consent for permission to participate in studies in compliance with the basic provisions of GCP (1996), Council of Europe Convention on Human Rights and Biomedicine (04.04.1997), WMA Declaration of Helsinki – Ethical Principles for Medical Research Involving Human Subjects (1964–2013).

Statistical processing of the study was performed using software packages Statistica for Windows (Stat Soft inc., USA), Microsoft Excel (Microsoft, USA). The probability of the difference between the arithmetic mean (M) and its error (m) between the study groups was determined using the bilateral Student's t-test. The difference was considered significant at a significance level $p<0.05$. Student's t-test was used only in the case of a normal distribution of equality of the general variances of the compared samples, which was checked using Fisher's F-test. In other cases, a nonparametric Mann-Whitney rank test was used to compare the results.

Results of the study and their discussion. It was found that the most common oral pathology in patients with gastric and duodenal ulcers is periodontal disease (Table 1), which was diagnosed in all patients with dentures (2–4 groups), which exceeded the prevalence of periodontal disease in the control group by 1.8 times ($p<0.05$).

Table 1

The structure of periodontal diseases in patients with peptic and duodenal ulcer, depending on the groups of prosthetics and control group, % (n)

Nosology		Control group, n=20	Groups of examined patients				Total, n=197
			Group 1, n=43	Group 2, n=65	Group 3, n=42	Group 4, n=27	
Acute catarrhal gingivitis, % (n)		5.0 (1)	–	–	–	–	0.5 (1)
Chronic catarrhal gingivitis, % (n)		40.0 (8)	35.0 (15)	4.6 (3) */**	16.6 (7) */**	22.2 (6) */***/#	19.9 (39)
Chronic generalized periodontitis	initial severity, % (n)	10.0 (2)	25.6 (11)	6.2 (4) */**	28.6 (12) */**/***	29.6 (8) */**/***/#	18.9 (37)
	I stage of severity, % (n)	–	18.6 (8) *	60.0 (39) */**	40.5 (17) */***	37.1 (10) */**/***/#	37.7 (74)
	II stage of severity, % (n)	–	7.0 (3) *	29.2 (19) */**	14.3 (6) */**/***	11.1 (3) */**/***	15.8 (31)
Total, % (n)		55.0 (11)	86.2 (37) *	100 (65) */**	100 (42) */**	100 (27) */**	92.8 (182)

Note: * – indicates that the difference is statistically significant when compared with control group ($p<0.05$); ** – compared with the 1st group ($p<0.05$); *** – compared with the 2nd group ($p<0.05$); # – compared with the 3rd group ($p<0.05$).

There was also a high prevalence of periodontal disease in patients of the 1st group – 86.2 %, with the difference with the control group in 1.57 times (p<0.05). The lowest prevalence of periodontal disease was found in the control group – 55 %, but it was of a high level, according to the WHO. In the general structure of periodontal disease in patients with GDU the initial and mild severity was prevailed, chronic catarrhal gingivitis and CGP of moderate severity were less frequently detected, but the percentage differed significantly in the comparison groups.

Chronic catarrhal gingivitis was diagnosed less frequently in the 2nd group in 8.7 times and 7.6 times (p<0.01), compared with the control and the 1st group respectively; in the 3rd group: in 2.4 times and 2.1 times (p<0.05); in the 4th group: in 1.8 times and 1.6 times (p<0.01).

Chronic generalized periodontitis of initial level was significantly more frequent in patients with GDU, compared with control group: in 2.6 times in the 1st group (p<0.01), in 2.9 times in 3rd group (p<0.01), in 3.0 times in the 4th group (p<0.01). The largest number of chronic generalized periodontitis of the first degree of severity was found in the 2nd group, which exceeded the value in the 1st group in 3.2 times (p<0.05), in the 3rd group – in 1.5 times (p<0.05) and in the 4th group – in 1.6 times (p<0.05). A similar trend is observed with chronic generalized periodontitis of the II degree of severity, the highest prevalence of which was also found in the 2nd group, which probably exceeds the data of the 1st group by 76.0 % (p<0.05), the 3rd group – by 51.0 % (p<0.05) and 62.0 % (p<0.05) compared with the 4th group.

Localized periodontitis was found in 29 (74.2 %) patients with chronic catarrhal gingivitis. Localized periodontitis of initial and I degree of severity was found in six patients (30.0 %) from the control group, in five people (11.7 %) of the 1st group, only one patient (1.5 %) of the 2nd group, three people (7.1 %) of the 3rd group and four people (14.8 %) of the 4th group. Localized periodontitis of the II degree of severity was diagnosed only in patients with GDU: in two people of the 1st, 2nd and 4th groups (4.7 %, 3.1 % and 7.4 %, respectively), and in four patients (9.5 %) of the 3rd group.

At a history of the disease most patients associated the development of clinical manifestations of periodontal disease with gastrointestinal disease, and their onset was observed approximately 5–7 days after the onset or recurrence of GDU.

To objectify the structural and functional state of periodontal tissues in patients with GDU, an index assessment was performed. The data obtained using the PMA index indicates a high intensity of the inflammatory response of the gums in patients with DGU, especially in patients with dentures (Table 2).

Table 2

Characteristics of periodontal tissues in patients with gastric and duodenal ulcers, depending on the groups of prosthetics and control group (M±m)

Indexes	Control group, n=20	Group 1, n=43	Group 2, n=65	Group 3, n=42	Group 4, n=27
PMA	0.19±0.04	0.32±0.01 *	0.54±0.03 */**	0.41±0.02 */**/***	0.35±0.02 */***
SBI	0.6±0.09	2.3±0.08 *	3.3±0.06 */**	2.6±0.05 */***	2.4±0.02 */***
Depth of periodontal pockets, mm	–	2.9±0.05 *	3.7±0.08 */**	3.3±0.11 */**/***	3.1±0.04 */**/***
OHI-S	0.75±0.2	1.64±0.13 *	2.58±0.07 */**	1.86±0.14 */***	1.71±0.13 */***

Note: * – indicates that the difference is statistically significant when compared with control group (p<0.05); ** – compared with the 1st group (p<0.05); *** – compared with the 2nd group (p<0.05); # – compared with the 3rd group (p<0.05).

The maximum value of the PMA index was found in patients of the 2nd group, which was in 2.8 times higher than in control group (p<0.01) and corresponded to severe gingivitis. In the 3rd group, the PMA index was by 24.1 % lower than in the 2nd group (p<0.01), but exceeded the control index in 2.2 times (p<0.05). The lowest values of PMA were found in patients of the 4th group, which were higher than the data of the control group by 45.7 % (p<0.01), with no significant difference between the indicators of this group and the 1st group (p=0.237).

Examining the results of the PMA index in details the largest number of people with healthy gums was found in the control group – in 45.0 % of people, in contrast to patients with GDU, among whom healthy gums were found only in six people (13.9 %) of the 1st group. The values of the PMA index, which corresponded to a mild degree of gingivitis, were most pronounced in the 1st and the 4th groups: in 23.3 % and 22.2 % of people, respectively. The PMA index, which was corresponded to the mild degree of gingivitis, was most established in the 4th group – in 62.9 % of people, which exceeds the value of control

group in 1.7 times (p<0.01), as well as a large number of patients was found in the 1st group – in 48.9 % and in the 3rd group – in 54.7 % of people, which is in 1.4 and in 1.6 times more than in the control group, respectively (p<0.05). High values of the PMA index were most often found in patients of the 1st group – in 55.4 % of people, which indicates a severe degree of gingivitis in patients with metal inclusions in the oral cavity.

The SBI indicates the severity of inflammatory reactions in the gums of patients with GDU. In the 1st and 4th groups, the SBI data did not differ from each other (p=0.415) and exceeded those in the control group in 3.8 and 4.0 times, respectively (p<0.05). The value of the SBI is much higher in the 2nd group, which exceeds the control group in 5.4 times (p<0.01), and in the 3rd group the index is in 4.3 times higher than in the control group (p<0.05).

In the majority of examined patients with GDU, unsatisfactory or poor hygienic condition prevailed, in particular, we have found unsatisfactory level of hygiene of oral cavity in all examined groups: in 55.8 % of patients of the 1st group, in 61.6 % of the 2nd group, in 59,5 % of the 3rd group and 59.2 % of the 4th group, which exceeded the indicator in the control group by 55.2 % in the 1st group (p<0.01), by 59.4 % in the 2nd group (p<0.01), 58.0 % in the 3rd and 57.8 % in the 4th group (p<0.05).

According to the WHO recommendations, in order to make a detailed qualitative and quantitative assessment of the condition of periodontal tissues, we analyzed the structural components of the CPITN according to the assessment codes of the examined patients. Code 0 (absence of pathological changes) was registered in 45.0 % of patients in control group, while in patients with GDU healthy periodontal tissues were observed only in 13.8 % of patients of the 1st group, which is in 3.3 times less than in the control group (p<0.05). Although, according to the WHO, this group of patients does not need treatment, but 20.0 % of the control group and 9.3 % of the 1st group needed training in individual oral hygiene.

The prevalence of bleeding gums (code 1) varied from 12.3 % in the 2nd group to 60.6 % of cases in the 1st group. Code 2 (presence of supragingival and subgingival calculus) was most often diagnosed in patients of the 1st group – in 57.0 % of people, while in other groups of patients the frequency did not exceed 38.0 %, what was in 5.7 times (p<0.05) more frequent than in control group. Patients in this category required, according to WHO recommendations, professional hygiene with the removal of dental plaque and correction of personal hygiene.

Code 3, which indicates the presence of periodontal pockets with a depth of 3.5–5.5 mm, was not detected in the control group, but in patients with GDU this component of CPITN was objectified. In particular, the lowest frequency of code detection was found in the 1st group – in 7.0 % of people, which probably differed from the 2nd group in 4.0 times (p<0.05), 3rd group – in 2.0 times (p<0.05), the 4th group – 1.6 times (p<0.05). The biggest number of patients with code 3 was found in the 2nd group of subjects – in 27.7 % of people, the greatest depth of periodontal pockets was also found in this group and was 3.7±0.18 mm. In the 3rd group, the frequency of periodontal pockets detection was in 1.9 times less than in the 2nd group (p<0.05), and the depth of the periodontal pockets was on average 3.3±0.11 mm. In the 4th group, the difference with the 2nd group was 2.5 times (p<0.05), the depth of the periodontal pockets averaged 3.1±0.04 mm. All patients in this category were offered to remove the dental plaque, conservative therapy and closed periodontal pockets curettage, as well as correction of personal hygiene.

Code 4, indicating the presence of deep periodontal pockets (>6 mm), was objectively diagnosed in only two patients from the 2nd group (3.0 %), who were offered deep open curettage and quality orthopedic treatment in the scheme of complex treatment.

The obtained data on the frequency of detection of periodontal diseases at gastric and duodenal ulcers patients coincide with the literature data [3, 13] and confirm the opinion that periodontal tissues, in the first place, reflect the pathological processes occurring in the gastrointestinal tract. 100 % detection of periodontal disease in patients with dentures, data of indexes of periodontal status (PMA, SBI, CPITN) indicate that the presence of metal inclusions in the oral cavity should be considered as a risk factor for the development and burden of existing periodontal diseases in this category of patients [2]. At the same time, the indicators of index assessment of periodontal tissues in patients with fixed ceramic dentures probably did not differ from patients without dentures (p>0.05) and least exceeded the data of the control group, which confirms the need for the most bioinert prosthesis in these patients.

The most common periodontal diseases were chronic catarrhal gingivitis and chronic generalized periodontitis of mild degree [6]. The development of moderate and severe periodontitits, in our opinion, was associated with a more severe clinical and endoscopic variant of gastric and duodenal ulcers and the presence of fixed metal dentures [10].

In addition to the concomitant gastrointestinal disease, the great importance for the pathogenesis of periodontal diseases had unsatisfactory hygiene of oral cavity. It was explained by the low level of

sanitary and hygienic knowledge of patients, as well as the features of structural materials of fixed metal dentures. Metal-containing dentures accumulate more plaque due to surface roughness, compared with non-metallic constructions, and contribute to the development of microbiological imbalance in oral cavity [7, 8], which confirms the index assessment of oral hygiene.

Conclusion

Periodontal diseases in patients with gastric and duodenal ulcers are detected in 86.2 % of people without dentures, and in 100 % with fixed dentures. The highest number of cases of chronic generalized periodontitis of I and II degree of severity was found in the group of patients with fixed metal dentures (in 60.0 % and 29.2 % of people, respectively) and in patients with fixed metal-ceramic dentures (in 40.5% and 14.3 %, respectively) against the rate in patients with fixed ceramic dentures (in 37.1 % and 11.1 %) (p<0.05). The presence of metal inclusions in the oral cavity according to the assessment of indexes of periodontal status was a risk factor for the development and burden of periodontal disease at the presence of gastric and duodenal ulcers.

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