

Prognostic Risk Factors for the Development of Disorders of Occlusive Relationships in Patients with Temporomandibular Myofascial Pain Syndrome

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Abstract

Aim: Psychoemotional stress is currently recognized as one of the significant risk factors affecting human health. Recent studies have highlighted its role in the development of various dental pathologies, in particular disorders of occlusive relationships. The purpose of this study is to determine the frequency and severity of psychoemotional stress in patients with occlusion disorders, as well as to identify key symptoms of psychological stress that affect dental health.

Material and methods: The study was conducted at the Department of Dentistry of Volgograd State Medical University and included 120 patients aged 18 to 44 years with various disorders of occlusive relationships. The patients were divided into three groups depending on the degree of tooth abrasion. The PSM-25 questionnaire (Lemyr-Tessier-Fillion), adapted for the Russian-speaking audience, was used to assess the level of psychoemotional stress. The data were subjected to statistical analysis, including correlation analysis, to identify the relationship between stress levels and the severity of occlusive disorders.

Results: The results of the study showed that all patients included in the study experienced psychoemotional stress. The most common indicators of psychological stress have been identified: bruxism, clenching, physical malaise, fatigue and sleep disorders. Correlation analysis has demonstrated the presence of a direct relationship between the level of psychoemotional stress and the severity of occlusive disorders. Patients with more pronounced clinical manifestations of occlusal imbalance also had higher stress levels.

Conclusion: The study confirmed the significant influence of psychoemotional stress on the development and course of disorders of occlusive relationships. The identification of key symptoms of psychological stress in patients with occlusive disorders is important for practical dentistry, as it allows to improve the diagnosis and treatment of these conditions. However, for a more accurate and differentiated approach to diagnosis, it is necessary to take into account many risk factors and hidden relationships, which requires further research.

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Keywords: Disorders of occlusive relationships, psychoemotional stress, correlation relationship.

Introduction

Currently, scientists consider psychoemotional stress as one of the key risk factors for the development of various general somatic diseases [1, 2]. Its influence on the

occurrence and course of dental diseases, where stress liability acts as an aggravating factor, has also been established [3]. The issue of the influence of psychoemotional stress on the unity of the dental system remains relevant.

Temporomandibular myofascial pain syndrome (TMMPS) is a common condition characterized by chronic pain in the temporomandibular joint (TMJ) and surrounding muscles, often accompanied by limited jaw mobility and occlusal dysfunction. The prevalence of TMMPS ranges from 31–76% in the general population, with a higher incidence among women [4]. In addition to psychoemotional stress, other risk factors for TMMPS include malocclusion, bruxism, trauma, and systemic diseases such as fibromyalgia.

Studies conducted by Zubareva A.S., Bragin A.V. et al. (2022), as well as Khan SIR, Aljammaz G. et al. (2023), showed that before a visit to the dentist, patients have a lower threshold of emotional stability and an increased stress level [5,6]. Modern research highlights the concept of stress-induced pathology, which implies pathological conditions caused by prolonged psychoemotional stress without proper correction. It has been proven that such pathologies negatively affect all body systems, including the oral cavity.

One of the key conditions that allow us to judge the possible long-term psychoemotional stress is a violation of occlusive relationships. Given the increasing prevalence of occlusion disorders and the exacerbation of pathologies of the stomatognathic system, it is important and relevant to investigate the frequency of psychoemotional stress in these patients in order to assess its impact on the development and course of occlusive disorders.

Current treatment approaches for TMMPS include occlusal splints, physical therapy, pharmacological management, and psychological interventions aimed at reducing stress and improving coping mechanisms [7, 9]. Recent studies have demonstrated a strong correlation between chronic stress and the severity of TMMPS symptoms, suggesting that stress management should be an integral part of the treatment protocol [10, 11].

The aim of the study is to determine the frequency and severity of psychoemotional stress in patients with disorders of occlusive relationships.

Materials and Methods

An observational, single-center, prospective, selective, controlled, non-randomized study was conducted. It includes 120 patients aged 18 to 44 years with disorders of occlusive relationships. All participants underwent a dental examination, including basic and additional techniques, according to the study design shown in Figure 1.

The study was conducted at the Department of Dentistry of the Institute of NMFO VolgSMU of the

Ministry of Health of the Russian Federation in Volgograd. It was attended by patients who sought dental care.

The study consisted of a single visit to a dentist, which included planned manipulations: examination, palpation of the masticatory muscles and temporomandibular joint, and a questionnaire.

All patients underwent a dental examination, including a survey, examination of the face and oral cavity, palpation of soft tissues, chewing muscles and temporomandibular joint. The study complies with the standards of the Helsinki Declaration. All patients signed an informed consent, which is confirmed by Protocol No. 087 dated 04/15/2024 of the Local Ethics Committee of the Volga State Medical University of the Ministry of Health of the Russian Federation.

To determine the level of psychoemotional stress, the PSM-25 (Lemyr-Tessier-Fillion) psychological stress scale was used in adaptation according to N.E. Vodopyanova. The questionnaire included 25 questions with an 8-point scale, where 1 point indicates the absence of stress, and 8 indicates its high level. The calculated integral index of mental tension (PPN) was used to assess stress levels.

The survey of patients with occlusive disorders and the study of the correlation between the level of psychoemotional stress and the severity of clinical manifestations of occlusive imbalance. Patients were divided into three groups according to the degree of abrasion of hard dental tissues (according to the classification of M.G. Bushan, 1979) to assess the correlation between stress levels and the severity of occlusal imbalance.

Occlusive disorders were recorded on the basis of a clinical examination. The stress level was determined on the PSM-25 scale, and the correlation between stress symptoms and occlusive disorders was analyzed using the method of variance analysis.

Statistical analysis was carried out using Microsoft Excel 2016 and Statistica 13.0 programs. The method of multidimensional correlation analysis was used.

Results

The study included 120 patients aged 18 to 44 years with disorders of occlusive relationships. After a clinical dental examination, the patients were divided into three groups:

The first group included 42 people with tooth abrasion within the enamel. The second group included 49 patients with disorders of hard tissues within the enamel and partially dentin. The third group consisted of 29 people with tooth abrasion within the dentin.

The study showed that all participants were exposed to psychoemotional stress in their daily lives to one degree or another (Fig. 2).

The frequency of occurrence of psychological tension of varying severity among the participants was 100%. Since the interpretation of the survey results turned out to be quite diverse, an analysis of individual criteria that are most significant for dental health was carried out. The data is presented in table 1.

These indicators indicate the presence of somatic manifestations of psychoemotional stress, which exacerbate the course of dental pathology. Moreover, the severity of these disorders increases with increased clinical manifestations of tooth hard tissue abrasion (Fig. 3).

Among the identified factors of the emotional sphere that indicate stress, there are: a feeling of tension and

excitement, forgetfulness, impaired concentration, mood swings. All study participants reported rapid fatigue (Fig. 4).

To identify the relationship between stress symptoms and disorders of occlusive relationships, a correlation analysis was performed (Table 2). In all cases, a positive correlation was revealed, which increases with the transition from one group to another, indicating the influence of psycho-emotional stress on the severity of occlusive disorders. In addition, the most informative indicators in the analysis and diagnosis of stress-induced occlusion disorders are symptoms of bruxism and/or clenching, psychological tension, as well as fatigue.

Table 1. Study of symptoms of psycho-emotional stress in patients with disorders of occlusal relationships.

The symptom	Average level (points, M±m)		
	1 Group (N=42)	2 Group (N=49)	3 Group (N=29)
Feeling of tension and excitement	4,31±0,198 (N= 40)	5,83±0,111 (N=49)	6,68±0,12 (N=29)
Physical malaise	4,02±0,072 (N=34)	5,62±0,107 (N=45)	6,02±0,12 (N= 29)
Xerostomia	3,63±0,123 (N= 31)	4,31±0,159 (N= 43)	5,63±0,191 (N=28)
Forgetfulness	3,61±0,119 (N=30)	4,85±0,17 (N= 40)	5,77±0,19 (N= 26)
Fatigue	4,31±0,103 (N=42)	5,92±0,124 (N= 49)	7,31±0,263 (N=29)
Bruxism and/or clenching	3,08±0,099 (N=19)	4,87±0,185 (N= 44)	6,08±0,122 (N= 28)
Sleep disorders	5,28±0,121 (N= 33)	5,69±0,165 (N=38)	6,28±0,151 (N=24)
Impaired concentration	4,74±0,147 (N=39)	6,04±0,097 (N=48)	6,91±0,276 (N= 28)
Mood swings	3,13±0,063 (N=28)	4,26±0,085 (N= 34)	5,17±0,186 (N= 20)

Table 2. Results of correlation analysis of the considered symptoms of psycho-emotional stress by group.

The symptom	The level of correlation		
	1 group	2 group	3 group
Feeling of tension and excitement	0,47	0,51	0,63
Physical malaise	0,12	0,11	0,14
Xerostomia	0,19	0,19	0,21
Forgetfulness	0,12	0,15	0,13
Fatigue	0,54	0,52	0,51
Bruxism and/or clenching	0,69	0,77	0,75
Sleep disorders	0,3	0,36	0,41
Impaired concentration	0,24	0,18	0,22
Mood swings	0,1	0,11	0,08

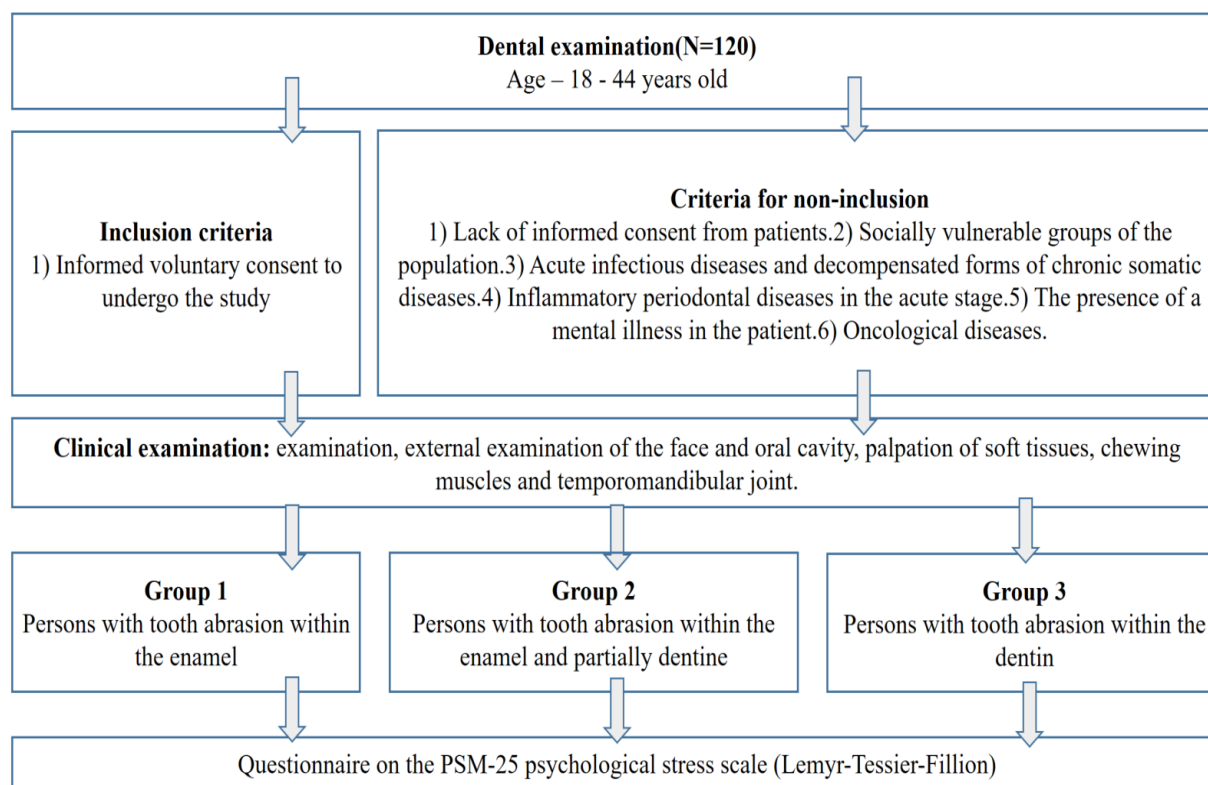


Figure 1. Study design.

An indicator of psychological tension (%)

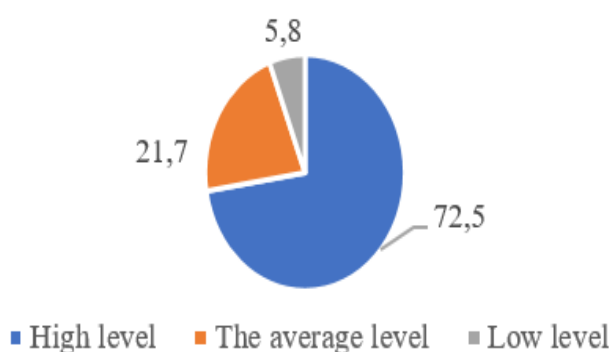


Figure 2. Level of psychological tension in patients with disorders of occlusal relationships.

The frequency of occurrence of symptoms of psychoemotional stress (cf. score, abs.)

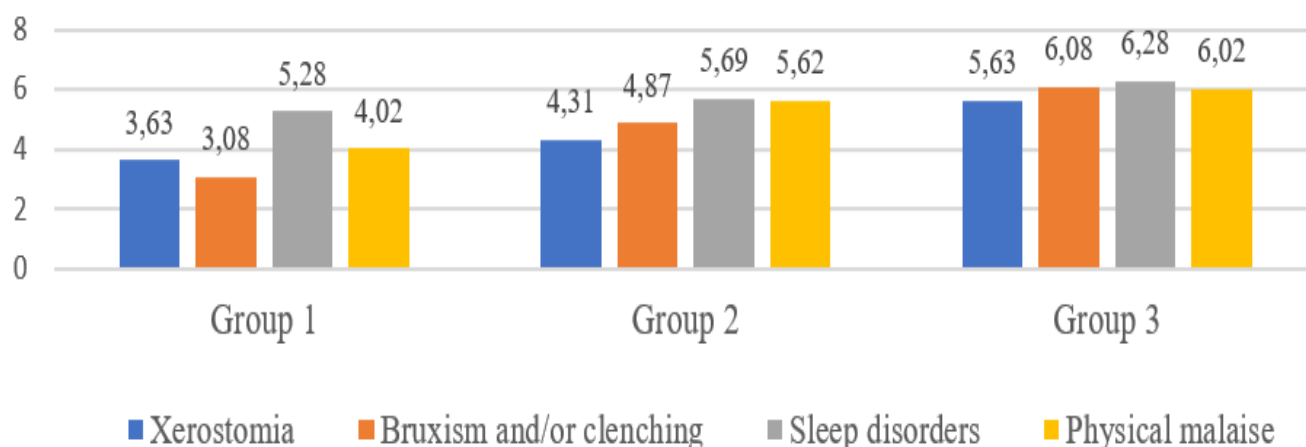


Figure 3. Frequency of occurrence of somatic symptoms of psychoemotional stress.

The frequency of occurrence of symptoms of psychoemotional stress (cf. score, abs.)

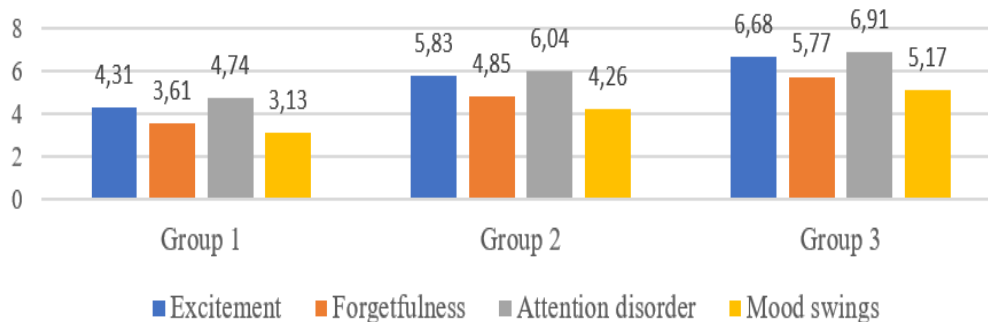


Figure 4. Frequency of occurrence of symptoms of psychoemotional stress.

Discussion

The results of the study confirm the significant influence of psychoemotional stress on the development of disorders of occlusive relationships.

In recent years, there has been an increase in the number of patients with disorders of occlusive relationships, one of the key risk factors for which is a high level of psychoemotional stress. In this regard, it

becomes especially important to identify symptoms of psychological tension that have a negative impact on the stomatognathic system. This is of great importance for practical dentistry.

With an increase in the frequency of symptoms of occlusive imbalance, the need for a predictive approach to correct them increases. According to one theory, psychogenic factors play a significant role in the occurrence of occlusive disorders, while the level of

psychological tension is critically important. Since stress-induced symptoms can manifest not only emotionally (agitation, mood swings), but also somatically (sleep disorders, physical malaise), a comprehensive approach to the management of such patients is required.

The study revealed that the most significant symptoms of psychological tension in patients with occlusive disorders are: a feeling of tension and agitation, physical malaise, xerostomia, forgetfulness, fatigue, bruxism and/or clenching, sleep disorders, impaired concentration, mood swings. In all cases, a positive correlation was established between the symptoms of stress and the severity of occlusive disorders, which confirms the influence of psychological tension on dental disharmony.

Stress levels can serve as a quantitative indicator justifying an interdisciplinary approach in the treatment of such patients. It also highlights the need for consulting support from specialists for psychological correction. Assessment of stress levels is an objective criterion for the effectiveness of diagnosis and treatment, reflecting changes in the psychological state of patients.

Conclusion

Psychoemotional stress is an important risk factor for the development of disorders of occlusive relationships, having a significant impact on their occurrence and course. The study revealed the most common indicators of psychological stress in patients, including bruxism, clenching, physical malaise, fatigue and sleep disorders. Correlation analysis showed a direct relationship between the level of psychoemotional stress and the severity of occlusive disorders. Determining the role of psychoemotional stress helped to identify key symptoms important for diagnosis in dental practice. However, the implementation of a differentiated diagnostic approach requires a comprehensive assessment of many risk factors, especially taking into account hidden relationships.

Ethical Statement

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