

Zuszek Agnieszka, Borek Joanna, Malak Roksana, Samborski Włodzimierz. Temporomandibular joint dysfunctions in the context of psychological disorders among pediatric patients. *Journal of Education, Health and Sport*. 2019;9(12):82-86. eISSN 2391-8306. DOI <http://dx.doi.org/10.12775/JEHS.2019.09.12.009>
<https://apcz.umk.pl/czasopisma/index.php/JEHS/article/view/JEHS.2019.09.12.009>
<https://zenodo.org/record/3586118>

The journal has had 5 points in Ministry of Science and Higher Education parametric evaluation. § 8. 2) and § 12. 1. 2) 22.02.2019.

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The authors declare that there is no conflict of interests regarding the publication of this paper.

Received: 01.12.2019. Revised: 05.12.2019. Accepted: 20.12.2019.

Temporomandibular joint dysfunctions in the context of psychological disorders among pediatric patients

Dysfunkcje stawu skroniowo-żuchwowego w kontekście zaburzeń psychologicznych wśród pacjentów pediatrycznych

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Abstract

There are many factors that affect temporomandibular joint dysfunction. These may include, among others: structural and postural disorders, bruxism, and occlusive abnormalities. In addition, an important aspect are psychological factors that, as a result of stress, can affect temporomandibular joint disorders through hyperactivity of the muscles, followed by biomechanical changes and related pain. These factors can lead to the production of neurotransmitters that disturb the balance of serotonin and catecholamines. Aim: Literature review to determine the relationship between temporomandibular joint disorders and psychological disorders in pediatric patients Material and methods: Based on the Research Gate, PubMed and Google Scholar databases, a review of scientific papers was performed

using the keywords: (temporomandibular joint), (stress, bruxism, mental disorders). Articles from the last 5 years have been analyzed. Results: Higher levels of anxiety are observed in patients with temporomandibular joint disorders. There is also a higher incidence of depression and chronic stress. Conclusions: Available literature shows the relationships between dysfunctions within the temporomandibular joint and mental disorders of the patient. However, research in this area should continue to show more detailed information regarding both the general relationship between the abovementioned aspects and the relationship between individual temporomandibular joint disorders and psychological aspects.

Key words: Temporomandibular disorders; stress; depression

Introduction

Temporomandibular joint disorders are one of the most common facial cranial dysfunctions. They usually affect young adults and middle-aged adults, and are less common in children and the elderly. They can have various grounds - from tooth defects, jaw, jaw and other elements of the skull, through posture defects, up to mental disorders. Temporomandibular joint dysfunction can cause, among others, headache, facial muscle pain, intracranial disorders, e.g. crackling, problems in chewing food [1,2,3]. Temporomandibular joint disorders often go hand in hand with psychological disorders of patients. Higher levels of anxiety are often seen in people with temporomandibular joint disorders. A higher frequency of depression and chronic stress is also noted [4,5]. The way the human body reacts to stress can sometimes be positive, for example when we make quick decisions and react immediately in the face of a potential threat [6]. People respond to stressful situations by increasing the expression of adrenocorticotrophic hormone and cortisol [7]. Repeatedly stressful events can affect the excessive activation of the hypothalamus, pituitary gland, adrenal glands, thereby increasing the level of cortisol that is released during a stressful event [8]. When examining a patient, every risk factor for temporomandibular joint disorders should be considered in order to properly diagnose the patient and plan the therapeutic process.

Aim

This paper reviews the literature on the relationship between temporomandibular joint dysfunctions and mental disorders of the patient.

Material and methods

A review of the literature was conducted in terms of the relationship between mental disorders and psychological problems of the patient and the occurrence of temporomandibular joint dysfunction. This work is for reference only. A review of the PubMed research database resources was carried out using the keywords: (temporomandibular joint), (stress, bruxism, mental disorders). The following inclusion criteria were used in the study:

1. The participants of selected analyzes were people from the age of two to the age of 18.
2. The researchers of individual articles were to demonstrate the relationship between the temporomandibular joint abnormalities and the patient's mental disorders.

The researchers considered the exclusion criteria to be:

1. Previous oncological and neurological diseases, patients with multiple sclerosis, epilepsy.
2. Articles in which patients of various ages were examined, making the research group heterogeneous.

The authors focused on reports published in English and Polish. Finally, the authors chose to discuss 6 articles, which were characterized in Table 1 and in the descriptive content.

Results

According to the authors of this work, in the studies presented there are links between dysfunctions within the temporomandibular joint and mental disorders of the patient. Higher levels of anxiety are often seen in people with temporomandibular joint disorders. A higher incidence of depression and chronic stress is also noted. However, the authors emphasize the shortage of sufficient scientific evidence to support the above-mentioned correlation. The greater part of scientific research is carried out without taking into account the control group or with improperly planned research work, for example by selecting the wrong research group or measuring tests.

The problem under consideration in this work was presented in a tabular study - Table 1, which includes the studies: Pereira et al. [9], Pizolato et al. [10], Al-Khotani et al. [11], Kobayashi et al. [12], Sampaio et al. [13], Sermet Elbay et al. [14].

Tab. 1 Characteristics of individual research works.

Author	Research group	Age	Type of tests used	Research goal	Summary
Pereira et al., 2009	558 people	12 years	GCPS (Graded Chronic Pain Scale) and depression and somatization were measured	Assessment of the relationship between psychological variables and clinical diagnosis of temporomandibular joint disorders.	The psychological aspect and female gender are significant risk indicators associated with TMD, even in children.
Pizolato et al., 2013	Research group - 40 Control group - 42	9-12 years	HADS- Hospital Anxiety and Depression Scale	Assessment of factors associated with temporomandibular disorders in children.	According to the authors, open mouth and anxiety levels were associated with temporomandibular joint disorders in children. Due to the cross-section of this study, observed relationships may have a two-way relationship.
Al-Khotani et al., 2017	456 people	10-18 years	Research Diagnostic Criteria for TMD for axes I and II, and then assessed their problem according to the Youth Self Report scale	Examined whether psychosocial problems, amongst which the stress, anxiety and depression, are associated with disorders of the temporomandibular joint, both occurrences of pain and no pain in this joint.	Pain in the temporomandibular joints in children and adolescents does not affect social activity. Temporomandibular joint pain may be strongly associated with emotional functioning, with higher frequencies of anxiety, depression than children and adolescents without TMD pain.
Kobayashi et al., 2017	Research group - 38 Control group - 38	7-14 years	MASC-(Brazilian Version) - Multidimensional Anxiety Scale for Children	It was examined whether the level of salivary amylase and cortisol and the occurrence of anxiety symptoms differed in children presenting disorders in the temporomandibular joints.	Children with temporomandibular joint disorders had higher scores in the assessment of anxiety symptoms. However, no difference was observed in the secretion profile of salivary stress parameters between paired groups of children with and without TMD.
Sampaio et al., 2018	Research group - 48 Control group - 36	6-10 years	LSSI - Lipp Stress Symptom Inventory CSS -Child Stress Scale	The incidence of bruxism during sleep in children and their mothers relative to stress was investigated.	Mental stress did not show a statistically significant relationship with sleep bruxism in either mothers or their child.
Sermet Elbay et al., 2016	Research group - 184 Control group - 201	8-18 years	Questionnaire taking into account the coverage of TMD	The frequencies of the temporomandibular joint disorders in children living with their parents and children living in care and education facilities were assessed and compared.	A relationship has been demonstrated between temporomandibular joint disorders and stress levels in children living at home with their parents and children living in institutional protective care.

Discussion

There are many factors that affect temporomandibular joint dysfunction, including postural and structural disorders, occlusive abnormalities, bruxism, macrotrauma, or microtrauma [15,16,17]. According to Kindler et al., psychological factors may affect temporomandibular joint disorders through muscle hyperactivity, followed by biomechanical changes and related pain. They can lead to the formation of neurotransmitters disrupting the balance of catecholamines and serotonins. In addition, temporomandibular pain may be a physical manifestation of Common Mental Disorders [18]. In the research by Pereira et al. They emphasize the fact that the psychological aspect and female gender are important risk indicators associated with the occurrence of temporomandibular joint disorders [9]. Pizolato et al. Assessed that the level of anxiety and width of mouth opening are associated with temporomandibular joint disorders in children [10]. Al-Khotani et al. Proved that a group of patients with temporomandibular joint disorders accompanied by pain showed more frequent occurrence of anxiety problems and depression, as well as somatic complaints compared to the group without these disorders. It was also noted that aggressive behavior was more frequent in the pain group. Attention was drawn to the fact that in the pain group psychological problems were more frequent than in the group without pain and in the group where there were no problems with the temporomandibular joint [11]. Research by Kobayashi et al. Showed that there is no significant difference in levels of stress biomarkers, such as salivary amylase and cortisol, between children exhibiting temporomandibular joint disorders and children without this problem. It was noted, however, that children with TMD have a higher level of social anxiety [12]. A study by Sampaio et al. Showed that there are no significant associations between socio-demographic variables and bruxism occurring during sleep. A higher frequency of this disorder was also found in children whose mothers also suffered from this dysfunction. It was found that there is no significant relationship between the occurrence of bruxism during sleep and stress, both in children and their mothers [13]. The work of Sermet Elbay et al. Proved that the overall incidence of temporomandibular joint disorders and oral paraphunction was higher in children living in childcare centers than in children living with their parents. Children from childcare centers have proved more susceptible to this type of disorder. However, the relationship between the presentation of disorders in the oral cavity and the occurrence of stressful life situations was found in both examined groups [14].

Summary

The scientific literature used to create this review indicates that there is a relationship between mental and chronic stress disorders and the occurrence of temporomandibular joint disorders. All the analyzed works point to the fact that stress, anxiety or depression are often closely related to TMD. Bruxism also appears very often in research as a disorder related to psychological aspects. However, research in this area should continue to show more detailed information regarding both the general relationship between the abovementioned aspects and the relationship between individual temporomandibular joint disorders and psychological aspects.

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