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Bruxism, that is, the impact of stress on temporomandibular joint

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Abstract

The pace of life in the 21st century, stress and all its negative effects make this problem a civilization disease. In 2013, World Health Organization provided the guidelines on the procedures in the cases connected with stress. About 77% of population regularly feels physical symptoms of stress, 17% suffers from bruxism (gnashing of teeth).

The occurrence of bruxism has large impact on functional quality of temporomandibular joint. A long-term disease may lead to limitation of movements, which causes serious deterioration of quality of life. Bruxism may also lead to the disorders within muscles making moves in the discussed joint such as hypertrophy of masseter and temporal muscle, which results in the change of shape of the face („square face") and to pain in the region of the attachments of these muscles.

Many people suffer from bruxism and the effects of functional disorders of the temporomandibular joint are a serious health problem. Therefore, education making people aware of this disease and early diagnostics to implement appropriate treatment are necessary.

Introduction

Civilization diseases is a set of conditions related to negative effects of living in highly developed civilization. Constantly growing pace of life in the 21st century and multitude of everyday obligations are very stressful, which leads to „chronic stress" [1]. Therefore, stress with all its negative effects is classified as a civilization disease. In 2013, World Health Organization provided the guidelines on the procedures in the cases connected with stress [2].

Depending on predisposition of a given person, stress may have mobilizing (eustress) or negative (distress) impact [3]. Therefore, stress is a set of reactions causing psychophysical agitation, leading in extreme cases to inhibition and even retention of the functions of system. Long-term exposition to stress and stressful reactions may lead to damages and dysfunction of organs, in which clinical symptoms of stress occur, that is, psychosomatic disease [4]. One of such symptoms is disorder of stomatognathic system, also in the temporomandibular joint, caused by abnormal functions of stomatognathic system [5,6,7]. About 77% of population regularly feels physical symptoms of stress, 17% suffers from bruxism (gnashing of teeth) [2].

For the first time, the problem of disorders of temporomandibular joints was noticed by Wright in 1920. [8]. The syndrome of symptoms of tinnitus and impaired hearing connected with 11 symptoms within temporomandibular joint, oral cavity and headache (Costen syndrome) was described 14 years later [9]. These symptoms were connected with lowered occlusion caused by the lack of teeth in the side fragments of dental arch. In this way, the issue of disorders of temporomandibular joints was introduced to dentistry. In 1966, Ramfjord and Ash observed that the conditions of temporomandibular joint are not uniform group and proposed the division into three subgroups [10]. In 1977, team for terminology of functional disorders of stomatognathic system adopted the term temporomandibular mioartropathy covering all forms of disorders of these joints related to increased tension of masticatory muscles caused by abnormalities of occlusion and/or bite [11].

Bruxism

Bruxism is a medical term defining pathological rubbing of mandible teeth with jaw teeth [12]. It is one of the most frequent occlusion parafunctions in the stomatognathic system. It is also one of the most harmful parafunctions of stomatognathic system due to its self-destructive impact [13]. Centric (daytime) and eccentric (night-time) bruxism can be distinguished. In the case of daytime bruxism, teeth are strongly clenched in the centric occlusion, whereas, in the night-time bruxism, teeth are gnashing involuntarily, although some people even clench their teeth in both centric and eccentric occlusion. In addition, bruxism is divided into primal (idiopathic) and recurring (iatrogenic) [14,15]. In both cases, it may occur during the day and during the sleep. However, recurring bruxism may also

be associated with sleep disorders, mental conditions, neurological or appear during applied pharmacotherapy [16,17]. Literature show that bruxism occurs, regardless of sex, in 8% of adult population. It occurs more often in young people, even 20% (more often in women than men). The occurrence of bruxism reduced by 3% in people above 60 years old. [18,19]

Excessive stress, parasitic infections or malocclusion are probable causes of bruxism. Most of the research show that mental factors as significant in formation of this disease. People having anxiety disorders and strongly oriented towards success are in the risk group [20]. Chronic stress in these people leads to the change of sensitivity of muscle receptors, which, through excessive excitement, leads to increased and uncontrolled contractions of masseter muscles [21].

The research on the impact of psychological factors on the occurrence of bruxism, due to application of various research groups and psychological tests, give divergent results. [22,23,24]. Some research show that bruxism occur more often in people with high emotional stress and that bruxism is connected with specific personality traits: aggression, anxiety, hyperactivity or the need of control [25,26]. There are also research classifying people with bruxism as cautious and shy, having low self-esteem, having problems with expressing their feelings and prone to worrying [27,28]. The research that included type of personality can be divided into two groups. In the first group, bruxism occurs in ambitious people, living in constant haste, who like to compete with others, whose typical behaviours include: tensing up facial lines and muscles of the whole body, clenching teeth [26]. In the second group, bruxism occurs in introverted people, who vent their suppressed emotions and stress through parafunctional behaviours [29].

The consequences of bruxism include gomphiasis, wear of tooth crowns and inflammatory lesions in the temporomandibular joints. Progressing symptoms also include the occurrence of tarsus, wearing, maceration and anaemia of cheek mucosa and tongue along occlusion line. A symptom of bruxism may also be bleeding while washing teeth and paradental atrophy. In some cases, it may even lead to systemic symptoms such as headache, neck pain and backache caused by increased tension of muscles of shoulder girdle. In extreme cases, it may cause earache and hearing disorders [12]. Pain within the temporomandibular joint is 65% of all ailments related to bruxism [2].

Temporomandibular joint

Temporomandibular joint, due to its morphological structure, is a paired condylarthrosis, coupled in every movement. It works all the time, also at night. The mechanics of the joint is based on three movements: hinged (lowering and lifting of the mandible), tobogganing (sliding forward and backward in the upper floor of the joint) and chewing (milling – combination of both types of movements). Distinguishing feature of the temporomandibular joint is its articular

surface, covered with avascular fibrocartilage. Therefore, cartilage is abrading relatively quickly, which makes temporomandibular joint prone to various factors (e.g. biological, environmental), exposing it to dysfunctional changes. The disorders within the temporomandibular joints are large percentage of the conditions of facial part of the skull [30]. The dysfunction of temporomandibular joint may lead to many problems connected with disorders of masseter muscles and bones building this joint and tissues around it. Pain caused by dysfunction of this joint may have a muscular (masseter muscles) and/or bone form (within the joint caused by inflammatory or degenerative lesions) [31]. Any disorders occurring within these structures are usually connected with strong pain and discomfort for the patients. Therefore, diagnosing the symptoms related to the conditions of this joint is particularly important in dental practice [30].

The occurrence of bruxism has large impact on functional quality of temporomandibular joint. Inflammatory and degenerative lesions in the temporomandibular joints may lead to many complications. Long-term disease may lead to limitation of the movements, which causes serious deterioration of quality of life. Bruxism may also lead to disorders within muscles making moves in the discussed joint such as hypertrophy of masseter and temporal muscle, which results in the change of shape of the face („square face") and to pain in the region of attachments of these muscles [12].

Summary

Many people suffer from bruxism and its effects related to functional disorders of the temporomandibular joint are a serious health problem. Therefore, education making people aware of this disease and early diagnostics to initiate appropriate treatment are necessary.

Every patient suffering from bruxism should be treated individually due to frequent concomitance of this disorder in various disease entities. An analysis of concomitant diseases in terms of intensification of symptoms of bruxism is significant. Early diagnostics and treatment of bruxism prevent occurrence or intensification of conditions of stomatognathic system.

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