Effect of Oral Parafunction on the Occurrence of Clinical Signs and Symptoms of Temporomandibular Dysfunction in a Rijeka Population

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Summary

The aim of this investigation was to obtain data on the incidence of clinical signs and symptoms of temporomandibular dysfunction in the Rijeka population and to ascertain possible mutual correlation between particular signs and symptoms.

The investigation included 408 subjects, 164 men and 242 women aged 18-85 years. After completing a questionnaire a clinical examination was performed of all subjects.

The following frequency of particular signs and symptoms were determined:

- *Bruxism during the night in 17% women and 14% men.*
- *Bruxism during the day in 34% women and 30% men.*
- *Sounds in the temporomandibular joint (TMJ) during movement in 26% women and 25% men.*
- *Headaches more often than once in a month in 34% women and 19% men.*

Of the patients with bruxism 37% experience headaches more frequently than once in a month, 35% pain in neck muscles and 33% sounds in the TMJ during mandibular movement.

Of the patients without bruxism 41% experience headaches, 28% pain in neck muscles and 24% sounds in the TMJ.

For statistical analysis χ^2 test and odds ratio (OR) were used. Data were analysed by computer programmes Med Calc and Statistics for Windows. Statistically significant difference was found for the frequency of certain signs and symptoms of temporomandibular dysfunction (TMD) in the group of women. No statistically significant difference was found between oral parafunction and signs and symptoms of TMD.

It can be concluded that day and night bruxism caused increased pain in the neck muscles and that the increased occurrence of sounds in the TMJ during mandibular movement was more frequent in women, although this was not statistically significant.

Key words: *temporomandibular dysfunction, questionnaire, epidemiology.*

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Introduction

Temporomandibular or craniomandibular dysfunction is a common term which includes numerous disorders of the masticatory muscles, jaw joints and surrounding structures. Pain is the most frequent symptom, usually localised in the region of the masticatory muscles, preauricular region and in the temporomandibular joint (TMD). Pain usually occurs after function, i.e. mastication. Apart from pain the patients often experience limited or asymmetric mandibular movements with clicking or crepitation in the maxillary joint (1). During the last fifty years many authors have attempted to establish an etiological factor, although the term most frequently used is multi-factor. Anatomic, pathophysiologic, traumatic and psychosociologic factors can participate in the development of TMD symptomatology. Aetiology can be observed from two aspects - static and dynamic. The static model can be a combination of inorganic-functional and organic disorders, such as inflammatory and degenerative changes and trauma (2). However, the dynamic aspect of etiological factors is more frequent, which, according to the American Academy of Orofacial Pain in 1981, can be classified as predisposed, initial and recurrent (3).

Interest in TMD epidemiology started in Scandinavia and northern Europe in the early 1970s and in North America after the end of the 1980s. Numerous epidemiological studies demonstrated that some signs and symptoms are frequently present in more than 50% of inhabitants. A questionnaire is often used in epidemiological investigations, because of its many advantages. It is considered to be more authentic than an interview because it eliminates examiner prejudice and expectation. With such a questionnaire it is easy to learn whether we are dealing with a TMD patient or not (4).

In our investigation we paid particular attention to bruxism and its effect on headache, sounds in the joint and pain in the neck muscles. Oral parafunction such as grating, bruxism, nail biting and frequent chewing of chewing gum, can precipitate muscular disorders, particularly when there is an occlusal problem. As bruxism is quite common in today's social milieu it deserves special attention. Bruxism is defined as the clenching, grating and grinding of teeth during non-functional movement of the mandible.

We differentiate bruxism which occurs during the day and during the night as two separate problems of different aetiology. Bruxism during the day is considered to be an acquired habit, while bruxism during the night is connected with disturbed sleep and occurs under the influence of stress. It has been recorded that bruxism at night can occur even when a person breathes through the mouth, or in apnea (5).

In some articles bruxism is defined as grating, and clenching is described as forces which are created while the teeth are in occlusion. Although it was formerly believed that bruxism is connected with occlusal factors, little scientific proof for this can be found in the literature. Many people during their lifetime experience a short period of night bruxism, of which they are frequently unaware. Morning headaches and tension of the masticatory muscles can suggest the occurrence of clenching or grating the teeth at night (6). In 1980 Marks noticed correlation between bruxism and allergy and suggested that if the symptoms of allergy are alleviated, a decrease in symptoms of bruxism would occur (7). Allergy most frequently causes nasal obstruction and consequently the condition of open mouth, which can be associated with bruxism.

The aim of this investigation was to determine the frequency of signs and symptoms of TMD which are most frequently present in the Rijeka population.

Furthermore we also investigated the possibility of correlation between bruxism and headache, clicking in the joint and the occurrence of painful neck muscles.

Materials and Methods

In this investigation a questionnaire with 11 questions was used (3). After which an examination served the purpose of determining the prevalence of signs and symptoms of TMD, based on positive answers in the questionnaire. The questionnaire contained questions which indicate the presence of pain (headache, muscular pain), functional disorders (clicking, inability to sufficiently open the mouth), parafunctional disorders (clenching and grating), traumatic injuries, systemic joint diseases.

The investigation included 408 subjects, who for various reasons were referred to the Dental Clinic

of the Health Centre in Rijeka. Results were expressed by frequency and were correlated by the test of proportion for independent samples. Mutual correlation of particular symptoms was expressed by odds ratio.

Results

Approximately 16.1% of the subjects answered the question: "Do you grate your teeth while you sleep?" affirmatively, 17.3% women and 17.3% men. Conscious clenching of the teeth during the day occurs in 33.3% of subjects, of which 35.5% women and 30.12% men. There is no statistically significant difference between these two groups.

The question: "Do you hear sounds coming from your mandibular joints during movement of the lower jaw?" was answered affirmatively by 26.45% women and 25.30 men. There is no statistically significant difference between men and women.

The question: "Do you suffer from headaches?" was answered affirmatively by 27.94% of subjects, most of them had headaches once or twice a month. As in other studies women showed higher prevalence, 33.8% compared to men, 19.2%. Statistically significant difference exists between them.

The aim of this investigation was to find a possible link between bruxism and headaches, painful neck, painful neck muscles and sounds in the joint during mandibular movement. The results obtained indicate that patients suffering from bruxism complain more frequently of painful neck muscles, i.e. 34.48%, compared to 28.57% in the control group (Table 2). During mandibular movement sounds in the joint occurred more frequently in the group of patients with bruxism, i.e. in 32.58% compared to 24.36% in the control group.

Discussion

The investigation was based on subjective assessment of signs and symptoms of TMD. The questionnaire, which consisted of 11 questions, provided the frequency of particular signs and the difference between the genders. On the whole the results obtained corroborate the results in the literature (4, 8-11).

Many authors have studied bruxism and its relation to TMD, and the results obtained occasionally support the concept of bruxism as a precipitating factor and occasionally do not (12). In our investigation 30% of men and 35% of women consciously clench their teeth during the day, and at night 14% men and 17% women.

Kieser investigated the youngest population; i.e. a group aged 6-9 years, longitudinally after 5 years, and concluded that bruxism spontaneously disappears (13).

On the other hand Kinderknecht considered that significant correlation exists between bruxism, pain in the TMJ and muscular tension (14).

In our group we found 26% women and 25% men experienced sounds during mandibular movement. Similar symptoms in other examined groups have been reported in the literature, most frequently between 25% and 43% (15-22).

The prevalence is high, above 60%, and more frequent in women than men, who more frequently suffer from migraine and tension (23). It is considered that female sexual hormones play a significant role (5). Le Resche believes that the use of exogenous hormones, particularly oral contraceptives, increases the possible occurrence of pain (24-27). A worryingly high prevalence in children, as high as 85%, was observed in a group aged 10 to 16 years. Considered to be the most frequent consequence of an acute infection followed by spontaneous self-healing.

When investigating seventeen-year-olds, Wanman noticed significant difference between girls and boys. Namely 48% of the girls and only 16% of the boys had headaches (28). Pilley studied 500 nineteen-year-olds and noticed an increase in the frequency of headaches at the age of 12-15 years, while after the age of 15 years the symptoms stabilised although they were more frequent in girls (29). Salonen studied a population aged from 20 to 80 years in groups in relation to age, and 15% to 40% had headaches (30). A similar finding in a similar population was reported in a study by Agerberg, in which 30%-40% women had headaches, and 20%-30% men (16). Helkimo noticed the occurrence of headache in 62%, i.e., 75% with regard to the examined group, while Jagger found headache more than once a month

in 36%, and more frequent than twice a week in 13% (22). Jagger et al found statistically significant correlation between bruxism and recurring headaches and pain in the masticatory muscles (22).

In our investigation patients with bruxism complained more often of painful neck muscles, i.e. 34.83% compared to 28.57% in the control group. Sounds in the joint occurring during movement of the mandible were frequent in the group of patients with bruxism, i.e. 32.58% compared to 24.36% in the control group.

It is possible to compare our results with those of Ćelić et al (31), because they were obtained in the same geographical area. Their results indicate correlation between oral parafunction and specific clinical signs and symptoms of TMD. Because of the design limitation of the investigation (cross-sectional epidemiological study) and selected samples (subjects were younger, non-patient males), the authors concluded that causal correlation of these entities could not be presumed.

Conclusion

In our investigation on a sample of 408 subjects almost one third of the subjects had at least one clinical sign of TMD, most frequently sounds in the jaw joints during function. In the overall population they are present in 26%, equally in both genders. Significant difference between the genders was noticed in the prevalence of headache. The group of female subjects experienced headaches in twice as high percentage. Headaches are often associated with muscular tension and bruxism. In our investigation we did not find significant correlation between oral parafunction and headaches, although there was a slight increase in the occurrence of sounds in the joint in subjects with parafunction.

Epidemiological studies of the signs and symptoms of TMD demonstrate great differences in the prevalence, which is most probably because of the different methods applied, and not because of actual differences between the groups studied. Nevertheless, in most cases the female group has more frequent pain, which is not necessarily connected also to a worse dental status. This type of questionnaire cannot provide the etiological causes of TMD symptomatology, but does enable determination of patients with and those without, symptoms. Headaches and pain in the neck muscles can be a consequence of numerous pathological changes and very often a consequence of stress. Regardless of all the methodological differences dentists should be aware that symptoms of TMD are often present in numerous collateral signs which require appropriate treatment.