Correlation between parafunctional habits and temporomandibular dysfunction: Systematic review

Correlação entre hábitos parafuncionais e disfunção temporomandibular: Revisão sistemática

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João Gabriel de Souza Cavalcante
Student of the Faculty of Dentistry Paulo Picanço
Institution: Faculdade Paulo Picanço
Address: St. Joaquim Sá, 900 - Dionísio Torres, Fortaleza, Ceará, CEP 60135-218
E-mail: gabrielsouza311@gmail.com

Hellen Tomaz Araujo
Student of the Faculty of Dentistry Paulo Picanço
Institution: Faculdade Paulo Picanço
Address: St. Joaquim Sá, 900 - Dionísio Torres, Fortaleza, Ceará, CEP 60135-218
E-mail: hellentaraujo@outlook.com.br

Nathalia Elen Barbosa dos Santos
Student of the Faculty of Dentistry Paulo Picanço
Institution: Faculdade Paulo Picanço
Address: St. Joaquim Sá, 900 - Dionísio Torres, Fortaleza, Ceará, CEP 60135-218
E-mail: nathaliaebsantos@gmail.com

Thiago Roberto Guerreiro Silva
Student of the Faculty of Dentistry Paulo Picanço
Institution: Faculdade Paulo Picanço
Address: St. Joaquim Sá, 900 - Dionísio Torres, Fortaleza, Ceará, CEP 60135-218
E-mail: trgs.thiago@gmail.com

Suely Cristina Aragão Veras dos Santos
Student of the Faculty of Dentistry Paulo Picanço
Institution: Faculdade Paulo Picanço
Address: St. Joaquim Sá, 900 - Dionísio Torres, Fortaleza, Ceará, CEP 60135-218
E-mail: suelycristinasc@gmail.com

Aline Kercia Adeodato Leitão
Master in TMD and Orofacial Pain from São Leopoldo College
Institution: Faculdade Paulo Picanço
Address: St. Joaquim Sá, 900 - Dionísio Torres, Fortaleza, Ceará, CEP 60135-218
E-mail: aline.kercia@facpp.edu.br

Paulo Roberto Barroso Picanço
Doctor in Orthodontics by Faculdade São Leopoldo Mandic na Universidade
Institution: Faculdade Paulo Picanço
ABSTRACT
Introduction: Temporomandibular dysfunction (TMD) is a term belonging to the orofacial pain group that affects the masticatory muscles, temporomandibular joint and adjacent structures. TMD can be triggered by parafunctional habits, which are actions performed without specific natural function of the human being, becoming risk factors. Objectives: To evaluate through a literature review the correlation between parafunctional habits and temporomandibular dysfunctions. Methods: The articles were researched in the PubMed and Scielo databases, from 2009 to 2019. As inclusion criteria: articles published in English and Portuguese with the key words "Temporomandibular Joint", "Parafunctional Habits" and "Temporomandibular Dysfunction". Themes that were not related to the theme were excluded. Results: Eight articles were selected, in which six of them correlated the parafunctional habits with the signs and symptoms of TMD. Through these studies, it was seen that people develop a painful symptomatology, affecting even quality of life. In parallel, through other articles, there is a possible relationship between the intensity of physical activity with the degree of TMD found, and also the emergence of certain habits after certain surgeries. Conclusion: It is remarkable the correlation between the various parafunctional habits and TMD. Thus, the dentist should be paid, during diagnosis, for their presence and consider, as part of the treatment, guidelines for the reduction of these habits, obtaining success in controlling dysfunction.

Keywords: Joint Temporomandibular, Parafunctional Habits and Temporomandibular Dysfunction.
INTRODUCTION

Temporomandibular dysfunction is the term used for the orofacial pain group that affects the masticatory muscles, temporomandibular joints and adjacent structures⁴. Its symptoms are characterized by the presence of pain in the face, limitations of certain movements considered functional of the mouth and presence of joint noises, such as cracking and crackling².

The prevalence of TMD is high and may affect children, adolescents, adults or the elderly. Age and gender are considered risk factors, and there is a higher predominance in women, whether mild, moderate or severe³. Systemic, psychological and local factors may contribute to the emergence of signs and symptoms of TMD, thus being multifactorial origin4,5.

Parafunctional habits are among the main etiological factors for the onset of TMD, which are grinding and/or tightening teeth (during the day and/or at night); chew gums; bite the tongue, lips and cheeks; gnawing nails/cuticles; put your hand and support the chin; press the tongue against the teeth and bite/gnaw objects such as pens or pencils. These practices cause an increase in muscle activity higher than necessary6,7. Among the parafunctional habits, bruxism is a repetitive muscle activity of the jaw involving the tightening or grinding of teeth during sleep or during wakefulness, being a controversial phenomenon that is not usually observable and measurable directly. The first parafunctional oral habits are acquired in childhood the most frequent is the habit of non-nutritive sucking, being related to sensations of comfort and protection. These practices can last until adulthood, such as nail gnawing, and can also be exchanged for other habits, since they are integrated into the subconscious of the individual, so he does not always realize that he performs it.

Most dentists are unaware of which parafunctional habits result in TMD and what the best treatment approach is associated, associating or not with psychological follow-up. Therefore, a literature review would be very relevant that encompassed this theme, in order to direct a better diagnosis to provide adequate treatment to patients with TMD and associated parafunctional habits.

Therefore, the aim of this study was to review the literature evaluating the relationship between parafunctional habits and temporomandibular dysfunctions.

METHODOLOGY

This systematic review was written according to prism. The research was carried out in Pubmed and Scielo databases, seeking studies conducted in humans published in English and Portuguese between 2009 and 2019 with the key words: "Temporomandibular Joint", "Parafunional Habits" and "Temporomandibular Dysfunction."
2.1 ELIGIBILITY CRITERIA

Inclusion criteria:
- Articles that were in English and Portuguese;
- Articles published in the last 10 years;
- Studies done in humans;

Exclusion criteria:
- Articles that did not relate parafunctional habits and TMD, only mentioned.

2.2 SCREENING PROCESS OF ARTICLES

Initially the articles were selected by title and summary according to the research strategy described. Articles that appeared in more than one database were considered only once. Finally, we used the inclusion and exclusion criteria in the appropriate period, and 08 articles were selected.

3 RESULTS

In view of the studies, several parafunctional habits were identified and reported, with the prevalence of bruxism most often. Concomitantly, some results did not define whether there was correlation with the signs and symptoms of TMD, but that risk factors for this dysfunction were considered.
| AUTHOR/YEAR           | RATED PARAFUNCTIONAL HABIT                                                                 | GROUP OF PEOPLE                                                                 | EVALUATION METHOD                                                                 | RELATIONSHIP WITH TMD |
|----------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------|
| Medeiros et al., 2011| Grinding/tightening teeth; nail gnawing; bite objects; chew gums; bite the cheek, sleep on one side; support objects on the chin; | Study involving 347 university students enrolled in the first and last years of health courses. | Anamnestic questionnaire containing questions related to TMD symptoms and the presence of parafunctional habits. | YES                   |
| Bortolotto et al., 2013 | Nocturnal and daytime bruxism; gnawing nails and cuticles;                                   | A study involving 205 people, but after exclusion criteria, 172 volunteers remained. | Questionnaire recommended by the American Academy of Orofacial Pain (AAOP).       | YES                   |
| Cortese et al., 2013  | Day and night bruxism, chew gum, bite lips, cheek and objects.                               | Study involving 54 patients aged between 10 and 15 years.                        | Questionnaire using the DRC/TMD, and self-report questionnaire regarding habits.   | -                     |
| Motghare et al., 2015 | Gnawing nails, lips; bite objects.                                                           | Study involving 240 adolescents between 10 and 19 years of age who study at school. | Screening questionnaire recommended by the American Academy of Orofacial Pain (AAOP), jointly analyzing patient history and clinical examination. | YES                   |
| Oliveira et al., 2016 | Grinding/tightening teeth; nail gnawing; bite objects; chew gums; bite the cheek, sleep on one side; support objects on the chin; | A study of 129 students, aged 16 to 19 years from public high schools.          | Anamnestic questionnaire containing questions related to TMD symptoms and the presence of parafunctional habits. | -                     |
| Chatzopoulos et al., 2017 | Evaluate the prevalence of symptoms of temporomandibular dysfunction (TMD) and parafunctional habits, as well as to investigate their association with age, gender and number of missing teeth. | 4204 randomly selected patients who were examined to determine their Symptoms of TMD, and presence parafunctional habits. | Anamnestic questionnaire                                                                 | -                     |
| Navarro, et al., 2018 | Day-time bruxism and tightening                                                              | A study involving 200 adolescents of both sexes, aged between 10 and 19 years.   | Self-reported questionnaire regarding habits, and questionnaire on the practice of physical activity according to the instrument proposed in the National School Health Survey (PeNSE). | NO                    |
| Ellie et al., 2018    | Habits in general                                                                            | Eighty girls from two 16-year-old high school, with or without symptoms, were invited to health information on two occasions and 60 girls participated. | Structured information on normal anatomy and function of muscles and joints on occlusion, oral habits and symptoms of orofacial pain/dysfunction and headache were provided. General relaxation has been instructed and trained. In a three-month follow-up, the same questionnaire about baseline symptoms was completed. | YES                   |
| Bruguiere et al., 2018 | Habits in general                                                                            | We included 237 patients undergoing orthodontic and surgical treatment for poor occlusions associated with dentofacial deformities | The diagnostic criteria were defined according to the DRC/TMD, as well as a self-report questionnaire on the habits of | NO                    |
4 DISCUSSION

Temporomandibular dysfunctions, when it comes to their etiology, have a multifactorial character, presenting several signs and symptoms. Occlusal trauma, psychosocial issues and parafunctional habits are some of the risk factors that can trigger a temporomandibular dysfunction. The latter is one of the examples of local factors in which studies show great relevance to the onset of joint or muscle pain in patients.

When evaluating the conditions of a group of patients, showed the degree of severity of temporomandibular dysfunction, with the prevalence of mild temporomandibular dysfunction, results mainly in female patients, since this group seeks treatment more frequently, and several studies relate this prevalence to physiological differences in sex, such as hormonal variations and lower pain threshold. This agrees with the results of other authors who also showed the same results. However, among these results it was found that parafunctional habits are not always associated with temporomandibular dysfunction, that is, they do not have a statistically significant association, but may be related to other factors, such as emotional tension and stress. Other habits such as putting your hand on the chin and sleeping on one side were also reported during studies. In addition, the habit of chewing cliclete is also seen as a parafunction since it promotes the functioning of the masticatory system. It is a habit that is related to adolescence, which is a common habit. These habits may or may not affect the structures of the masticatory system, provided that the physiological tolerance of the individual is not exceeded. If this occurs, parafunctions may become risk factors for the emergence of temporomandibular dysfunction.

There is still a few studies that relate parafunctional habits with temporomandibular dysfunction, but through the literature it is known that these habits constitute a group of risk factors that influences the onset of muscle and joint pain in certain patients. According to Motghare et al. (2015) certain habits such as biting lips or objects, chewing gum, gnawing nails and grinding or tightening teeth cause a force superimposed on the muscle triggering fatigue and certain muscle fatigue, causing even a pain to the Patient. At the same time, in Cortese et al. (2013) showed in its results that people with bruxism, that is, habit of grinding or tightening teeth, can trigger a possible unusable muscle pain, even if they are children or young people. Bruxism is a very common parafunction of being found clinically and is still constituted without a defined etiology, thus having contributing factors, such as genetics, anxiety, emotional stress, among others.

Therefore, it is also confirmed what was reported by Bortolleto et al. (2013) in which bruxism is rather a risk factor that is related to the appearance of muscle and joint pain, arising a temporomandibular dysfunction, which can become severe. But this does not exclude other
Parafunctional habits of also being predisposed to cause fatigue and muscle fatigue, and consequently having a temporomandibular dysfunction.

Some studies suggest that bruxism be analyzed separately to other parafunctions, due to its different pathophysiologies. This condition generates peripheral sensitization, since there is a release of inflammatory substances, making it a source of continuous pain that can lead to central sensitization.

It is known that there is a strong relationship between bruxism and temporomandibular dysfunction, but it is still undetermined whether it is actually considered a cause for this dysfunction. According to Ronald E. Goldstein et al (2017)13 daytime bruxism exacerbates the symptoms of temporomandibular dysfunction, which include headaches, joint and muscle pain in the jaw, in addition to the hyperactivity of the muscles involved, causing discomfort to the patient.

Bruxism is a phenomenon that also affects children, both in deciduous or permanent dentition. According to studies adult viscount wizards were also identified as wizards in the childhood period, that is, during life they brought this habit with them, generating even more possible temporomandibular dysfunction7,12,13,14.

The use of medications can cause this habit of grinding/tightening teeth, especially selective serotonin reuptake inhibitors and other classes of drugs that affect dopamine and other neurotransmitters15. Daytime bruxism may be related to nocturnal bruxism due to the affected neurotransmitters, but it is known that this daytime bruxism has a strong psychosocial component, and may be related to the stress suffered daily, for example, in professions that demand this emotion12,13.

At the same time, studies show the use of muscle relaxants in short periods of time to attenuate this bruxism. These medications often offer a drowsiness to the patient, affecting their daily lives16. In addition to medications botulinum toxins are also used as a way to decrease the symptoms of this bruxism. They are injected directly into the masseter and temporal muscles, and it is expected to have a decrease in muscle pain reducing the effects of this habit17.

Although some antidepressants have the ability to induce sleep, improving this cycle and reduce orofacial pain, these medications increase the ability of individuals to develop bruxism, or significantly increase this habit in people who have already has18. The use of paroxetine, venlafaxine and duloxetine was more likely to be associated with the development of bruxism19. Therefore, physicians should always report to patients about possible adverse effects during their prescription, particularly inhibitors of paroxetine and serotonin reuptake and norepinephrine18,19.

Psychoemotional aspects such as stress, anxiety and depression can be triggers for the onset of parafunctional habits, which can lead to the onset and persistence of myofascial pain20. According to Navarro et al (2018)21 is undeniable that physical exercise is essential the lives of people, both adolescents and adults, and that this brings health benefits as a whole. But in view of the study, it was
to observe whether the appearance of habits was intertwined with adolescents who exercised physical activity, but it was confirmed that although the practice of exercises decreased stress, there was no significant association with the presence, amount or type of parafunctional habit or with the presence of orofacial pain points, which could lead to a TMD\textsuperscript{21}.

Through studies, it is known that there is a correlation between orthodontics and the class of temporomandibular dysfunction, since the two "work" observing the occlusion of people, and thus having diagnoses of cross bites or open bites.

Lighter occlusions can be corrected with the use of orthodontic devices, but there are situations that is necessary with this a surgical treatment. Through studies, Bruguiere \textit{et al} (2018) analyzed whether there was an association between oral habits and the presence of signs and symptoms of temporomandibular dysfunction after orthognathic surgeries, and it was shown that there is a prevalence of bruxism in patients, but beyond this for function other habits risk factors for the presence of temporomandibular dysfunction symptoms are considered, even though orthodontic treatment is present and a combination with surgery. However, the control of these habits before surgeries helps prevent adverse health outcomes of temporomandibular dysfunction \textsuperscript{22}.

Finally, when you have information about anatomy, the function of the chewing muscles, the temporomandibular joint and guidance on reducing parafunctional habits can reduce the frequency of temporomandibular dysfunction symptoms\textsuperscript{22}

5 CONCLUSION

According to the studies, we conclude that there is a positive correlation between parafunctional habits and temporomandibular dysfunction, demonstrating that these habits may be risk factors for predisposing a temporomandibular dysfunction, whether mild or severe. Therefore, it is important that patients with this dysfunction have a multidisciplinary follow-up to have a reduction of these habits, obtaining control of this disorder. However, even yes, more studies are needed for greater understanding of this subject.

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