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Prevalence of cervical alterations in patients with temporomandibular dysfunction in a specialized referral service

Prevalência de alterações cervicais em pacientes com disfunção temporomandibular em um serviço especializado de referência

Prevalencia de alteraciones cervicales en pacientes con disfunción temporomandibular en un servicio de referencia especializado

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Abstract
The muscular structures of the body are interconnected, with the cervical and masticatory systems forming a part of the complex called Manducatory System, which is a part of the organic postural system. Alterations in one of these components induce compensatory changes and affect other systems. These adjustments can lead to temporomandibular dysfunction (TMD) and craniocervical dysfunction. Their etiology is multifactorial, with a high prevalence of chronic pain, especially in cases of headaches. Cervical alterations are common in TMD, considering the degree of pain and discomfort experienced by patients. This study aimed to conduct a survey of medical records regarding the frequency of TMD with cervical changes in patients who visited our institution between 2017 and 2019. Approximately 81.86% of patients showed cervical changes, and the sternocleidomastoid muscle showed the greatest involvement, especially in the mastoid portion. TMD showed greater involvement in women and was most prevalent between 40-49 years of age. This study contributes to scientific literature, since there are few reports highlighting the need to promote research and financial support in this subject area, which can help improve the diagnosis and treatment of these craniocervicomandibular disorders.
Keywords: Temporomandibular disorder; Cervical; Posture.

Resumo
As estruturas musculares corporais são interligadas, em que o sistema cervical e mastigatório faz parte de um complexo denominado de Sistema Manducatório, integrante do sistema postural orgânico. Alterações em um desses componentes induz compensações que irão repercutir no outro sistema. Estes ajustes podem levar ao desenvolvimento de disfunções tanto temporomandibulares (DTM) quanto disfunção craniocervical. Apresentam etiologia multifatorial, com alta prevalência e presença comum de dor crônica. As alterações cervicais são problemas comuns em DTM, considerando o grau álgico e de desconforto gerado ao paciente. Este estudo objetiva fazer um levantamento de prontuários acerca da frequência de DTM com alterações cervicais nos pacientes que visitaram o serviço entre os anos de 2017 a 2019. Aproximadamente, 81,86% dos pacientes exibiram alterações cervicais, e o músculo esternocleidomastóideo mostrou o maior comprometimento, principalmente em sua porção mastóidea. DTM mostrou maior acometimento em mulheres e maior prevalência entre 40-49 anos. Este estudo contribui positivamente para a literatura científica, visto ter poucos registros científicos evidenciando a importância de pesquisas e apoio financeiro que ajudem a melhorar o diagnóstico e tratamento dessas desordens craniocervicomandibulares.
Palavras-chave: Desordem temporomandibular; Cervical; Postura.

Resumen
Las estructuras musculares del cuerpo están interconectadas, y los sistemas cervical y masticatorio forman parte de un complejo denominado Sistema Manducatorio, que forma parte del sistema postural orgánico. Las alteraciones de uno

de estos componentes inducen compensaciones que repercuten en el otro sistema. Estos ajustes pueden conducir a la aparición de disfunciones temporomandibulares (DTM) y de disfunciones craneocervicales. Presentan una etiología multifactorial, con alta prevalencia y presencia común de dolor crónico. Las alteraciones cervicales son problemas comunes en los DTM, teniendo en cuenta el grado de dolor y molestias que se producen en el paciente. Este estudio tiene como objetivo hacer un estudio de las historias clínicas sobre la frecuencia de los TTM con cambios cervicales en los pacientes que acudieron al servicio entre los años 2017 a 2019. Aproximadamente, el 81,86% de los pacientes presentaban alteraciones cervicales, siendo el músculo esternocleidomastoideo el que presentaba mayor afectación, especialmente en su porción mastoidea. Los TTM mostraron una mayor implicación en las mujeres y una mayor prevalencia entre los 40-49 años. Este estudio contribuye positivamente a la literatura científica, ya que hay pocos registros científicos, destacando la importancia de la investigación y el apoyo financiero para ayudar a mejorar el diagnóstico y el tratamiento de estos trastornos craneocervicomandibulares.
Palabras clave: Disfunción temporomandibular; Cervical; Postura.

1. Introduction

Temporomandibular disorders (TMD) can be defined as a set of dysfunctions involving the temporomandibular joint (TMJ), masticatory muscles, and associated structures. When this disorder is associated with pathological changes in the cervical region, it is referred to as craniocervicomandibular dysfunction (CCMD) (Godinho & Cabral, 2019).

According to epidemiologic studies, TMD has become increasingly frequent; approximately 50%–75% of individuals present with signs of dysfunction, and approximately 25% have related complaints. In Brazil, even though approximately 37.5% of the population presents with at least one related symptom, only few studies have addressed the presence of TMD signs and symptoms. TMD is most prevalent in individuals aged 20–40 years; however, it can occur at any age. It has a higher predilection for women than men, with a ratio of 3:1 and even up to 9:1(Iunes, et al., 2009; Carrara, et al., 2010; Huttunen, et al., 2019).

TMD has a complex and multifactorial etiology and may be triggered by changes in the mandibular structure, neuromuscular changes, stress, anxiety, occlusion disorders, trauma that overload the TMJ, deleterious habits, inappropriately fitted restorations or prostheses, degenerative problems, parafunctional habits, deleterious habits, postural problems, spinal deviations, emotional issues, and other causes that lead to disharmony in the stomatognathic system (Godinho & Cabral, 2019; Iunes, et al., 2009).

The most important feature of this dysfunction is the chronicity of pain. Chronic pain is constant and recurrent, and the treatment is difficult and expensive. The approach is complex and non-linear, with the influence of pathophysiological, psychosocial, social, and cultural aspects and, consequently, there is diversity between the clinical features. Ordinarily, this requires multidisciplinary interventions. Pain is the main complaint of patients with temporomandibular disorder, which directly modulates patient behavior, and contributes to the establishment and maintenance of the condition. Moreover, it results in both psychosocial impairment and a decreased quality of life (Huttunen, et al., 2019).

The symptoms of TMD are diverse, with pain in the TMJ region being most frequent, apart from headache, sounds or clicking when moving joints, otalgia, facial pain, vertigo, tinnitus, sensation of ear fullness, fatigue, limitation in mouth opening during chewing, and neck pain. Moreover, it can aggravate preexisting headache, the discomfort and stress of which can cause tension in the masticatory muscles, extending to the muscles of the neck and shoulder (Godinho & Cabral, 2019; Iunes, et al., 2009).

Primary symptoms can be reported on account of jaw movements or during muscle palpation, during which pain radiates to the temporal or neck region. It is important to note that the disturbance of only one tissue structure is unlikely to explain all the symptoms, and the involvement of more structures is anticipated. (Godinho & Cabral, 2019; Cuccia & Caradonna, 2009; Matheus, et al., 2009).

This chain involvement is due to the interconnection of body structures through myofascial chains, which relates them to more distant regions. Therefore, TMD can affect the mandible and skull base, which are components of the craniomandibular system (SCM). The SCM is a biomechanical unit consisting of the mandible, skull, hyoid bone, supra-and infrahyoid muscles, and cervical spine, acting in an interconnected manner for stable functioning. Owing to this interrelationship, the presence of cervical changes can have an impact on the stomatognathic system and may affect the mandible and skull base, leading to TMD (Iunes, et al., 2009; Zieliński, et al., 2021; De Abreu, et al., 2021; Balthazard, et al., 2020).

There is a dynamic relationship between the TMJ and special muscle groups that allows the mandible to perform various movements during chewing. This represents the connection between the mandible and the base of the skull. The mandibular structure is interconnected by muscle and ligament connections to the cervical region, forming the craniocervicomandibular system or the manducatory system, and acts as a link between the anterior and posterior muscle chains. This grouping integrates the tonic postural system, which is multimodal, where the main sensors are the foot (nodal system), eyes (visual system), ear (vestibular system), and jaw (manipulator system). Imbalances in these complexes can result in myofascial pain caused by hyperactivity of masticatory muscles, decreased contraction force, and increased fatigue. This pain can be generalized, not only restricted to the muscles of the face and neck but extending to the shoulder region (Iunes, et al., 2009; Cuccia & Caradonna, 2009; Zieliński, et al., 2021; De Abreu, et al., 2021; Balthazard, et al., 2020).

The diagnosis is based on the characteristic signs and symptoms and can be difficult initially. The patient usually seeks other craniomaxillofacial specialists, such as otorhinolaryngologists and neurologists, who are often unable to identify the exact cause of the reported complaint. Because of an undefined etiology, the diagnosis must be made carefully through detailed anamnesis and physical examination with muscle verification through palpation. There are other resources that aim to improve the acquisition of data relevant to treatment, such as the diagnostic criteria (DC/TMD) requiring standardized evaluation of signs and symptoms (Portinho, et al., 2012; Fassicollo, et al., 2017; Klasser, et al., 2017; Girasol, et al., 2018).

DC/TMD is composed of two axes: physical diagnosis (Axis I) and psychosocial diagnosis (Axis II). Axis I consists of two groups: TMD associated with pain, and intra-articular TMD. Group 1 consists of three divisions: A, myalgia; B, arthralgia; and C, TMD-related headache. Group 2 comprises TMD associated with disk displacement, osteoarthritis, and subluxations (Girasol, et al., 2018).

This study focused on Group 1, with the majority of dysfunction cases being related to disorders of muscular origin. Subgroup 1A is further divided into the following types according to the nature of the pain: 1) local myalgia; 2) myofascial pain, and 3) myofascial pain with referral. The present study focuses on the subdivision 1.A.3, as they are most related to TMDs associated with craniocervical changes. Although the types described in the other groups and subgroups may be a consequence of muscular dysfunction or unfolding of this disorder, they are usually not the primary cause. Axis II addresses biopsychosocial factors such as stress, anxiety, and depression, as they are highly prevalent among patients. (Girasol, et al., 2018).

The diagnostic process is not standardized; however, there are ways to improve the treatment approach for this disorder. Anamnesis is the most important means of formulating an initial diagnostic impression, and is performed to identify predisposing, initiating, and perpetuating conditions. It is necessary to be aware of the involvement of psychosocial, emotional, cognitive, and social factors since emotional substrates are present in many TMD cases. Physical examination consists of palpating the TMJ and associated muscles, measuring active movement, and analyzing joint sound (Godinho & Cabral, 2019; Weber, et al., 2012; Nunes, et al., 2020).

The presence or absence of myofascial trigger points (MTP) in related muscles can be identified during muscle palpation. MTP can be defined as small hypersensitive areas located in palpable tense muscle bands in the skeletal muscles that can be triggered spontaneously or under mechanical stimuli. These areas of hyperactivity may be formed by a pathological increase in the release of acetylcholine by nerve endings in an abnormal motor plate at rest, which is the basis of the integrated trigger point hypothesis. The pattern of extension of pain is usually predictable, and knowing it can help direct the diagnosis and therapy to the source of the pain rather than to the site of the complaint (Godinho & Cabral, 2019; Weber, et al., 2012).

These morphological and functional changes can induce dysfunction of the neuromuscular system, characterized by increased fatigue of the cervical muscles, with the onset of TMJ and induction of craniofacial pain, leading to a change in mandibular postural position. Mandibular movement dysfunction can also be influenced by cervical symptoms in patients with TMD. The association between postural deviations of the shoulders, cervical spine, head, and other segments can lead to craniocervical dysfunction and subsequently perpetuate TMD (Godinho & Cabral, 2019; Zieliński, et al., 2021; Klasser, et al., 2017).

Owing to the interconnected network of body structures, a local change induces a chain reaction throughout the body, for which body adjustments are made through compensation or correction. These compensations can be upward or downward. Ascending deformation occurs when an imbalance in the lower segment generates impacts in the upper segment, whereas descending deformation occurs when an alteration in the upper segment generates a compensation in the lower segment. This phenomenon explains the neck and postural changes that occur in TMD (Iunes, et al., 2009)

It is important to note that within the DC/TMD for Group 1.A.3, dysfunction can lead to cervical alteration, as can the presence of non-physiological modifications of the cervical spine and vertebral column, leading to the appearance of a muscular disorder. The close relationship of the TMJ with the cervical musculature can lead to compensations and corrections that characterize the axis of dysfunction in its ascending or descending character. The criteria of standardized instruments used for evaluating TMD, such as the DC/TMD, help verify that TMD is either the cause of the sequelae in the other segments, as described above, or a consequence of ascending impairment (Nunes, et al., 2020)

Understanding the role of myofascial chains is of utmost importance in relating symptomatic aspects to structural imbalances. It is essential to study TMDs to address their influence, which is not restricted to the orofacial region and may affect cervical muscles. The undefined etiology, high prevalence, and clinical manifestation of TMDs directly affect patients' quality of life when chronic and self-limiting, emphasizing how timely and necessary it is for this subject to be debated and studied by professionals and researchers to develop a better approach to TMDs.

Thus, this study aimed to survey the frequency of TMDs in the presence of cervical alterations in patients visiting the Dental Polyclinic of Amazonas State University (POUEA) between 2017 and 2019. The authors have addressed a more specific sphere in the healthcare service to obtain information regarding the frequency of care in patients with TMD who present with cervical changes, and catalog data from the patient records of POUEA to identify the greatest prevalence by age group and sex. In addition, this study aimed to provide information regarding TMD evaluation focused on muscular verification, mainly the involvement of the sternocleidomastoid and trapezius muscles and the TMJ.

2. Methodology

In this retrospective study, the data of patients with TMD with cervical alterations were studied without distinction of sex, age group, ethnicity, or origin. Patients with incomplete data, such as data regarding muscle involvement characteristic of cervical alterations, were excluded.

The medical records of the patients were analyzed, and care was taken to ensure patient privacy. The information collected was obtained through a TMD evaluation form retrieved from the medical records in POUEA and organized using Word and Excel tools from the Office Package (Microsoft Office Professional Plus).

The form included information obtained during anamnesis and physical examination with muscle palpation. Muscle palpation was scored on a scale of 0-3, according to the scoring system developed by Okeson (2020), in which a score of 0 indicates no pain or discomfort when the muscle is palpated, 1 indicates discomfort (tenderness or pain) on palpation, 2

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indicates definite discomfort or pain, and 3 indicates a display of evasive action, tearing, or verbal expression of not wanting a certain area to be palpated again.

The study sample included 296 patients with TMD who visited the stomatology clinic between February 2017 and October 2019. After data collection, the following information was recorded: year, medical record number, age range, sex, parafunctional activity, vestibulocochlear alterations, and cervical involvement.

Cervical alterations in the sternocleidomastoid, posterior cervical (suboccipital trigone), and descending trapezius muscles were analyzed. Impairment was defined when the muscles had a score of 2 or 3 during palpation. The following topics were listed to verify vestibulocochlear alterations: presence of tinnitus, sensation of aural fullness, dizziness, vertigo, and analysis of the deep part of the masseter muscle.

Patient confidentiality was maintained during data collection and presentation of results in accordance with the guidelines of Resolution 466/2012 of the National Health Council, which regulates research on human beings. Approval was obtained from the Research Ethics Committee of the UEA (approval number: 4,244,150).

3. Results and Discussion

The 296 records were selected based on the inclusion and exclusion criteria. Of these, approximately 80.07% of the records contained an evaluation form for TMDs, while it was absent in 19.93% of the records, which were excluded from the study.

When analyzing the data according to sex, 81.86% of the patients were female, while 18.14% were male. The patients were divided into the following groups: 0-9 years (0.42%); 10-19 years (5.91%); 20-29 years (19.41%); 30-39 years (19.83%); 40-49 years (23.21%); 50-59 years (16.03%); 60-69 years (10.13%); 70-79 years (3.38%), and unknown (1.69%). The mean age was 41.45±15.39 years.

When analyzing the 237 medical records, cervical alterations were found in 81.86% of them. The muscles were given a score of 2 or 3 on the aforementioned scale.

Cervical involvement of the sternocleidomastoid muscle was evaluated in the mastoid, clavicular, sternal, and body portions, while also addressing its laterality, as shown in Figures 1 and 2. The posterior cervical muscles (suboccipital trigone) and the descending trapezius are shown in Figures 3 and 4, respectively. The term "not recorded" indicates the item that was not filled out by the operator, and "not included in the evaluation form" indicates the data that were not present in the records, especially the older ones (from 2017 to 2018).

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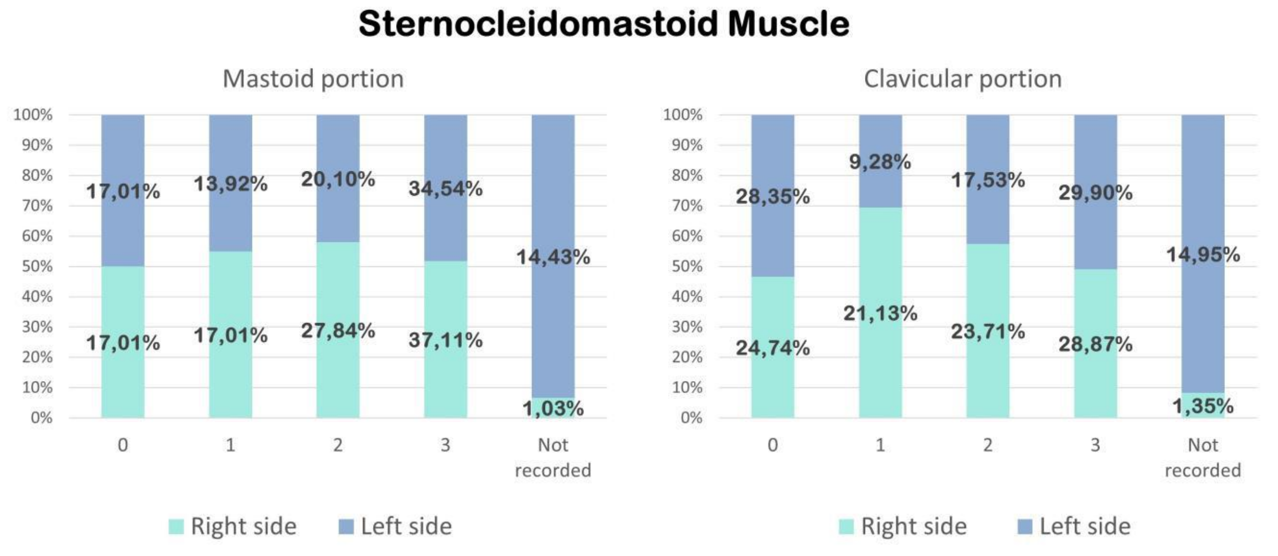
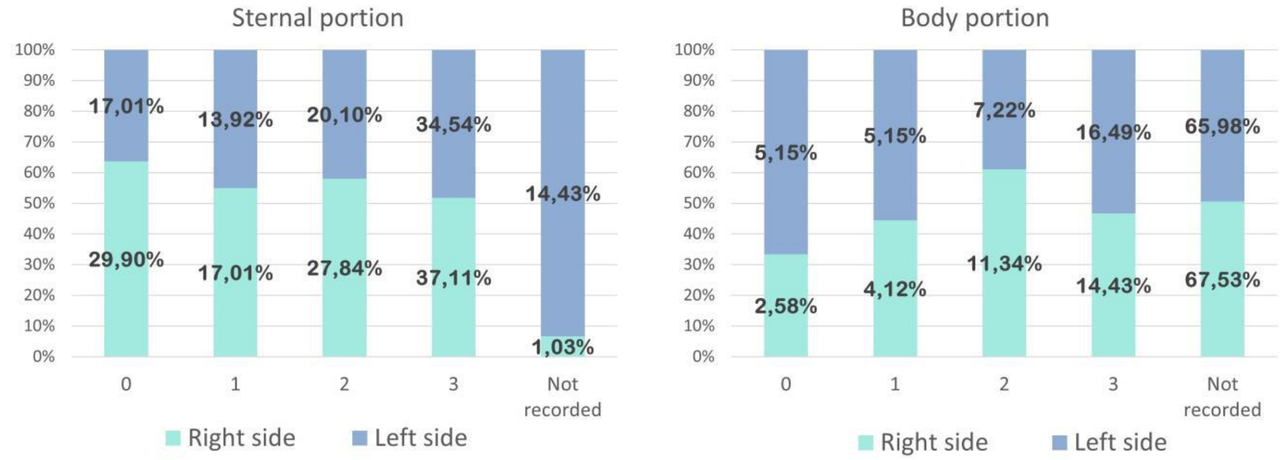
Figure 1- Distribution of the palpation scores of the mastoid and clavicular portions of the sternocleidomastoid muscle.



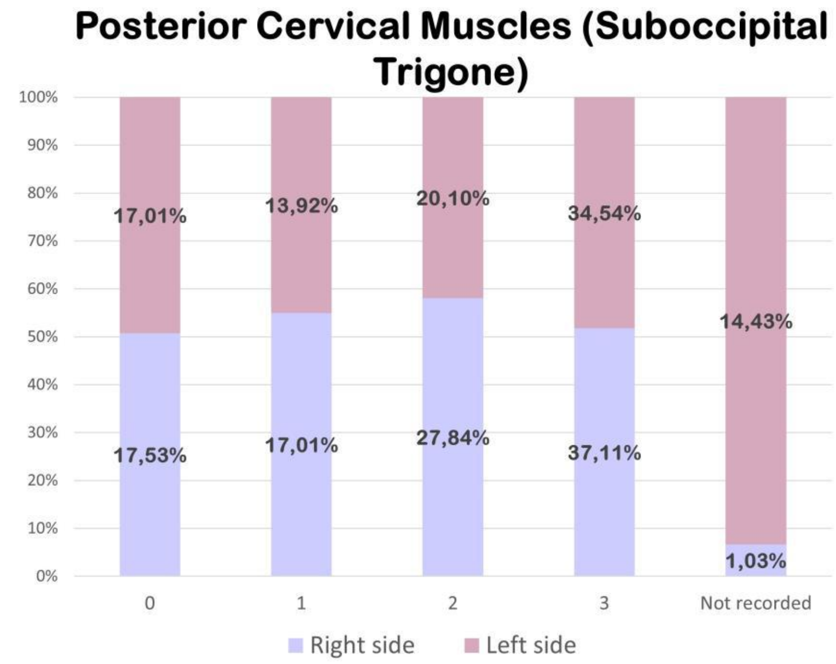
Source: Research data. (2021).

Figure 2- Distribution of the palpation scores of the sternal and body portions of the sternocleidomastoid muscle.



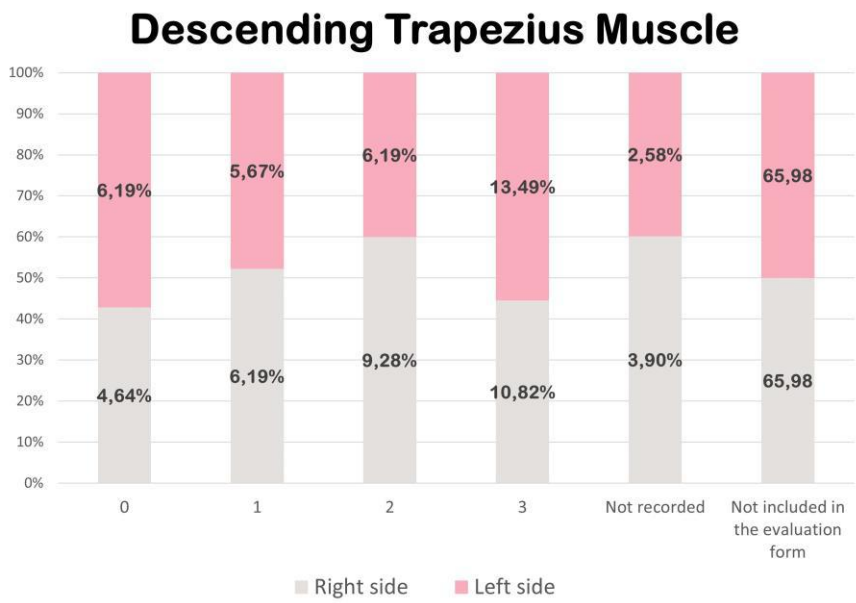
Source: Research data. (2021).

Figure 3 - Distribution of the palpation scores of the posterior cervical muscles (suboccipital trigone).



Source: Research data. (2021).

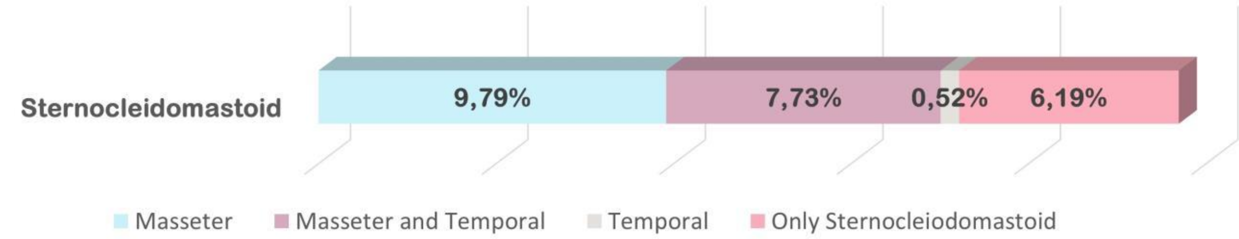
Figure 4 - Distribution of the palpation scores of the descending trapezius muscle.



Source: Research data. (2021).

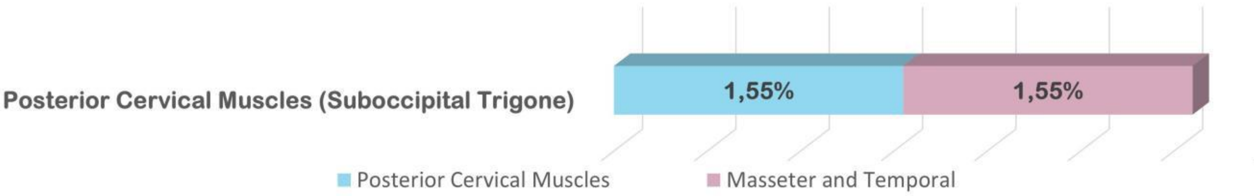
When scoring the individualized involvement of the posterior cervical muscles, sternocleidomastoid, and descending trapezius, it was observed that the descending trapezius muscle was not affected in isolation. The involvement of other muscles is shown in Figures 5 and 6. Only 14.95% of the medical records did not describe simultaneous involvement of the cervical and masticatory muscles with a score of 2 or 3, and in 0.52% of the records, these details were "not informed". Thus, in this scenario, isolated involvement of the sternocleidomastoid muscle was greater, as shown in Figure 7.

Figure 5 - Distribution of the sternocleidomastoid muscle palpation scores.



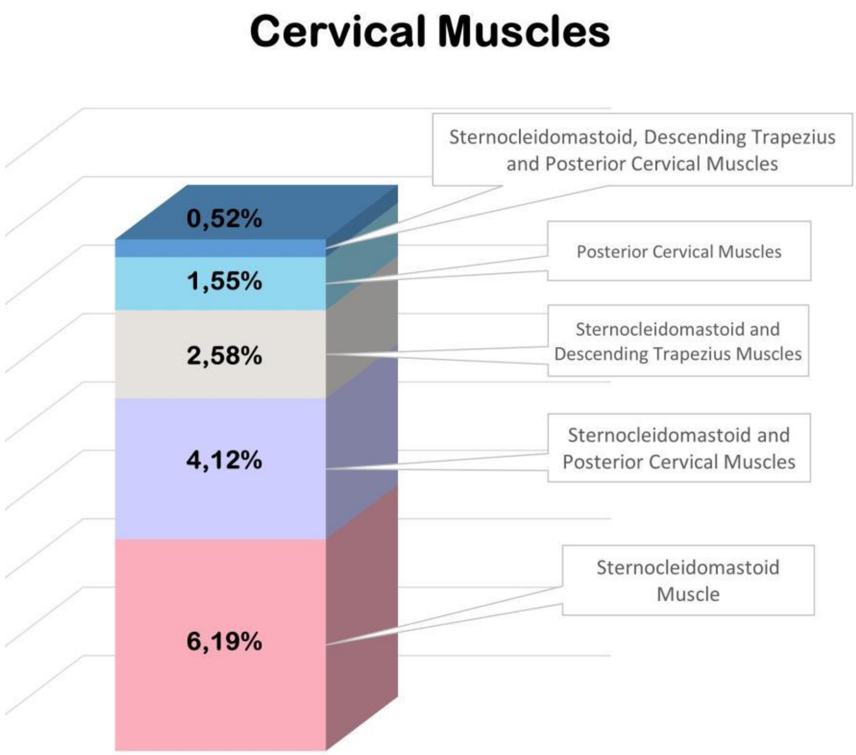
Source: Research data. (2021).

Figure 6 - Distribution of the palpation scores of the posterior cervical muscles (suboccipital trigone).



Source: Research data. (2021).

Figure 7 - Distribution of the percentage of impairment in the cervical region according to muscle involvement.



Source: Research data. (2021).

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To check whether the masticatory muscles were also compromised along with the cervical muscles, the masseter and temporal muscles were evaluated, as shown in Tables 1 and 2. The medial pterygoid muscle was not included in the evaluation form.

The relationship between concomitant cervical and vestibulocochlear alterations was also determined as shown in Table 3. Regarding the presence of parafunctional activity, 35.05% patients reported it as "absent," 10.82% as "don't know," 31.44% had bruxism, 7.73% had briquism, 1.55% had bruxism and briquism, and 5.67% had dental clenching, with "not informed" data in 7.73%.

Table 1- Distribution of the palpation scores of the masseter muscle.

	Right side			**Left side**		
	Scale 2 (%)	**Scale 3 (%)**	**Not recorded (%)**	**Scale 2 (%)**	**Scale 3 (%)**	**Not recorded (%)**
Proximal part	22,16	17,01	2,58	20,10	18,04	1,55
Part of the body fullness	29,38	18,56	3,61	28,35	18,56	2,06
Distal part	26,29	21,13	2,06	29,38	17,53	1,03
Deep part	25,77	20,10	3,09	28,87	21,13	2,58

Source: Research data. (2021)

Table 2 - Distribution of the palpation scores of the temporal muscle.

	Right side			**Left side**		
	Scale 2 (%)	**Scale 3 (%)**	**Not recorded (%)**	**Scale 2 (%)**	**Scale 3 (%)**	**Not recorded (%)**
Anterior bundle	20,62	8,76	3,61	19,07	13,92	2,58
Middle bundle	15,98	7,22	3,61	17,01	9,79	3,09
Posterior bundle	14,95	6,70	3,09	12,89	9,79	2,58

Source: Research data. (2021).

Table 3 - Distribution of the presence of vestibulocochlear alterations and cervical involvement.

	Absent n* (%)	Right side n* (%)	Left side n* (%)	Both sides n* (%)	Present n* (%)	Not recorded n* (%)
Presence of tinnitus	31 (15,98%)	36 (18,56%)	47 (24,23%)	51 (26,29%)	-	29 (14,95%)
Sensation of aural fullness	26 (13,40%)	41 (21,13%)	45 (23,20%)	53 (27,32%)	-	29 (14,95%)
Dizziness/ vertigo	63 (32,47%)	-	-	-	121 (62,37%)	10 (5,15%)

*n- Number of cases. Source: Research data. (2021).

4. Discussion

This study collected information from the medical records of a reference dental unit in the state to obtain a new perspective on TMD and CCMD. Notably, this is the only health unit in public service that treats TMDs. Moreover, a focus on cervical changes is necessary because of the scarcity of studies addressing muscle palpation and cervical MTPs.

There was a higher predilection for women than men, with an approximate ratio of 4:1. These results reinforce that women present higher results because they seek medical and dental care more often than men and because of physiological differences, such as the differences in the muscle fibers between the sexes. Women have more type I fibers, which are redder, have more mitochondria, are highly oxidative, function in aerobiosis, and are highly fatigue-resistant. On the other hand, men have more type II fibers, which have fewer mitochondria and blood vessels, work in anaerobiosis, and contract rapidly (Bueno, et al., 2018).

In addition, there is a differentiated activation of the limbic system, which is inhibited in men. Hormonal factors are also involved, since estrogen increases susceptibility to painful stimuli by modulating the limbic system. Nunes, et al., (2020) and Viana, et al., (2015) also reported ligament laxity resulting from hormonal changes, and more flexible and less dense joints. Many authors, such as Wiest, et al., (2019) and Weber, et al., (2012), evaluated only female patients, as they are the most affected by TMD. Some studies have considered sex as a risk factor for TMD (Chisnoiu, et al., 2015).

Regarding age range, our findings were in agreement with the existing literature showing the greatest prevalence between the third and fourth decades of life, in which the most prevalent age group was 40-49 years. The mean age was similar to that reported by Cátedra, et al., (2019).

One of the limitations of the present study is that the TMD evaluation form underwent modifications during the study duration. For example, in 2017 and 2018, many forms did not include an item on muscle palpation of the descending trapezius. Thus, the lack of standardization hinders the uniformity of the acquired information. Furthermore, many records were either not completely filled or did not use the scale recommended by the clinic. Many medical records did not have an attached TMD evaluation form, which limits both epidemiological surveys, and the provision of these patients, causing many of them to have long-term follow-ups.

When studying only files with a score of 2 or 3 for the cervical muscles, only 14.95% did not show any portion of either the masseter or temporal muscle with a score of 2 or 3. This finding is consistent with that reported by Weber, et al., (2012), who addressed the interrelation between cervical signs and the symptoms and severity of TMD and found that pain on palpation was the most relevant symptom. Portinho, et al., (2012) also reported cervicalgia (22.2%) as a diagnostic factor for TMD.

The sternocleidomastoid muscle showed the greatest impairment on palpation, particularly in the mastoid portion. Studies indicate that pain on palpation in TMD is most prevalent in relation to the sternocleidomastoid and descending trapezius muscles; however, evaluation of the trapezius muscle was impaired by the absence of this topic in the old forms, and this muscle is often not palpated during clinical examination. Thus, the data for this muscle did not reflect the actual prevalence of pain on palpation.

In relation to the presence of parafunctional activities concomitant with the involvement of cervical muscles, it was found that bruxism (31.44%) was the most prevalent, and this study mainly evaluated the present of bruxism, briquism, and teeth clenching. The findings are consistent with those of Portinho, et al., (2012) but could include other unidentified parafunctional habits.

Vestibulocochlear changes are highly prevalent in patients with TMD, as demonstrated by Zeigelboim, et al., (2017). However, it was not possible to collect data regarding the medial and lateral pterygoid muscles in this study because they were not listed in our TMD evaluation form.

The evaluation form can be improved by including a larger number of muscles, such as the lateral and medial pterygoid muscles, to corroborate the vestibulocochlear alteration data and obtain complete information regarding the masticatory muscles. Additionally, we included a topic referring to the signs and symptoms identified and reported in each patient to expand the relationship between the results obtained by muscle palpation and the clinical picture.

Tools other than the TMD evaluation form can be incorporated to obtain better results, such as photogrammetry, which can assess postural position and complement information obtained from muscle palpation items present in the form. Postural photography is a practical addition to TMD evaluation and enables the visualization of the patient's clinical picture. In addition to the use of photographs, systems focused on the presence of cervical changes, such as digital image-based postural assessment software, could be applied in future clinical research but at a higher cost (Chisnoiu, et al., 2015).

To improve the focus on CCMD, it would be interesting to invest in and train operators to use more targeted instruments, such as the Craniocervical Dysfunction Index and Cervical Mobility Index, as used by Weber, et al., (2012). Furthermore, to obtain more accurate results regarding muscle palpation, a tool called an algometer can be used, and the pressure pain threshold test can be performed, as employed by Stroppa-Marques, et al., (2017) and Weber, et al., (2012). Although performing this test would be expensive, the results would be more accurate than those obtained by both unidigital and bidigital palpation, since the latter may be influenced by operator subjectivity.

Moreover, it has been observed that most of the treatment failures in case of head and neck TMD are precisely due to the segmentation of the approach to the dysfunction, treating only the masticatory muscles, and not addressing the cervical region. Many professionals make an incomplete diagnosis of TMD and perform treatments that often show no clinical improvement. Since cervical repercussions also characterize the dental surgeon's work, a more targeted multidisciplinary approach is required to increase therapeutic success rates.

Thus, it is important to highlight the complexity of the treatment for CCMD, since it is a commonly occurring disorder, with its management being usually performed in a superficial manner, in which professionals see TMD as affecting a closed system and do not consider its relationship with the cervical muscle chain and repercussions.

5. Conclusion

There is a high prevalence of craniocervical changes in patients with TMD, and this research provides relevant data regarding the clinical applicability of muscle involvement, highlighting its importance in TMD diagnosis. Checking the prevalence of CCMD in Amazonas allowed us to evaluate data from a reference health unit in the state, as there is a high prevalence of patients with changes in cervical muscles.

The lack of standardization of the TMD evaluation forms limited the data obtained; however, despite this limitation, the importance of addressing the cervical trigger points and its correlation with the masticatory muscles must be emphasized to help direct funding and resources to CMMD treatment. Currently, there are few scientific records corroborating the importance of further research in this subject area.

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