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EVALUATION OF POST-RADIOTHERAPY ORAL SEQUELAE AND TEMPOROMANDIBULAR DYSFUNCTION / OROFACIAL PAIN IN A PATIENT WITH EMBRYONIC RHABDOMYOSARCOMA. REPORT OF A CASE

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ABSTRACT.

Determine the prevalence of Temporomandibular Disorders (TMD) symptoms on dental students of different dentistry faculties of Ecuador, searching possible differences between genders. Methods: 400 students of 6 universities of Ecuador were previously selected to complete the questionnaire of signs and symptoms of DC/TMD, which was translated into Spanish and verified using the Cronbach Index with 78,96% of reliability. Results were analyzed using Chi-squared test, in SPSS V22 software with 5% of allowed mistake and 95% of trust. Results: Women were found to be the predominant gender exhibiting symptoms (71%) between 17-27 years old ($p<0,05$). Mandible pain (76%) and headache (77%) were statistically significant in women ($p=0,007$ and $p=0,004$). Mandible pain was described as coming and going, for 1-3 years in 14,5% of the students and headaches were reported for three months. Mandible locks and noises had no significant statistical difference in relation to gender ($p>0,05$). 65,5% of the students reported doing exercises sporadically, 28,5% reported allergies, 15,5% night bruxism, and 2,3% day bruxism, 5% told to have a traumatism, and just 4,75% of the students sought treatment. Conclusion: high occurrence of TMD was found in Ecuadorian dentistry students predominantly in females. Nonetheless, less than 5% seek attendance. Findings illustrate the propagation of TMD to the general population and highlight the need for guidance in specialized treatments.

Introduction

Orofacial Pain signifies any pain associated with soft and mineralized tissues in the oral cavity, in the face, skin, bone, teeth, glands and muscles, affecting the motor and sensory transmission of the trigeminal nervous system. Among the painful conditions, Temporomandibular Disorder (TMD) is a common condition of orofacial pain, affecting about 10% of the general population.

TMD denotes musculoskeletal and neuromuscular conditions, involving the temporomandibular joint, masticatory muscles and or associated tissues. It can be considered of multifactorial etiology, where cognitive, biological, psychological, behavioral and environmental factors are involved.

The Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD-1992), was used for taking the biopsychosocial model of pain by standardizing criteria, taxonomy and nomenclature and thus securing a correct diagnostic for TMD. This instrument included two axes: one for physical evaluation, with each diagnostic criteria for each TMD, as well as anamnesis, clinical palpation of the masticatory muscles of the patient´s complaint; and the other for the psychosocial evaluation and incapacity in relation to the pain. Over the recent years o RDC/TMD was updated to the Diagnostic Criteria for Temporomandibular disorders, - DC/TMD-2012. The criteria were used in clinical settings as well as in investigation and surveys, complemented with physical examination and image

evaluation, to produce ample evidence and facilitate referral and interdepartmental communication for prediction of clinical cases.
The signs and symptoms presented by patients with TMD include pain, noises, and crepitus in Temporomandibular Joint (TMJ), closed locked mandible in opening and closing functions, difficulty in mouth opening, chewing pain with mandible movement, headache, muscle tenderness in the face, hearing complaints, ear pain, tinnitus and psychosocial effects1, 9, 10, 11, 12, 13. Patients may present anguishing pain experience that trigger sensory, emotional, cognitive and social damage with potential impact on daily activities and quality of life5. TMD´s symptoms are episodic and self-limiting while treatment is reversible and simple1, 4, 9, 15, [16, 22].

The literature finds: 1-75% of the population has at least one sign of TMD, and 5-33% subjective symptoms. Higher prevalence is found in women, being higher in ration of 4:1 compared with men, but merely 3 – 6% of patients seek out for treatment1. 20 to 40 years old is the target with more prevalence of TMD. A Brazilian study found 37,5% of the population presented a symptoms of TMD and 41,3%-68,8% of the students expressed at least one symptoms of TMD 2,15. The prevalence in children is from 16-68% with signs and symptoms of TMD, 10% with temporal muscular pain and 0,7-4% mandible pain and in the TMJ.

Using anamnesis questionnaires through the phone16 the Mexican population reported 46,1% TMD prevalence and the Italian population showed 25,6%, and in Latin America varies between 6-46% in children and, Brazilian adolescents. Studies demonstrated the disorder influences quality of life, psychological functions8, and has economic ramifications[7,8,17].

The literature about TMD in Ecuadorian population is limited, however, one study comparing Ecuadorian indigenous from Santo Domingo between Quechuas and Colorados, found 41% occurrence of one subjective symptom of TMD, and 63% of one objective sign. The symptoms were 16% pre-auricular pain, 36% TMJ sounds, 18% headache and 24% difficulty to open the mouth[18].

Among the patients seeking dental care at the Faculty of Dentistry from the Central University of Ecuador, 89 patients between 18-80 years old were evaluated, 38,2% were men and 61,8% were women, most ranging between 40-80 years old. The Fonseca Index was utilized to find 88,8% signs and symptoms of TMD. The symptoms were pre-auricular pain in 15,7% of the total population, headache in 28,1%, sounds of the TMJ in 32,6% and difficulty in opening the mouth in 10,1%[19].

Another study evaluated the prevalence of TMD in 41 boxers, 20% female and 80% male. 63,41% reported TMD signs and symptoms, which were 24,39% pre-auricular pain, 29,26% headache, 21,95% TMJ noises, and the presence of head trauma or in the mandible in 7,31%, yet 14,63% reported some treatment for their muscular or joint pain[20].

None of the formentioned studies employed the DC/TMD questionnaire to verify TMD signs and symptoms. Thus, the objective of this study was to determine the prevalence of the principal symptoms of TMD in dentistry students from 6 universities in Ecuador.

Methods

This study was approved in the Ethics and Research Committee of the Eugenio Espejo Specialities Hospital of Quito. Ecuador has 15 Dentistry Faculties of which 39% are public institutions, 33% are co-financed and 28% are private, with a total of 6395 students. The selected universities were Central University of Ecuador, San Francisco University of Quito, Equinoccial Technology University, International University of Ecuador, University of Americas and University Regional Autónoma of Andes Ambato. Participant´s ages ranged between 16-40 years old in dentistry faculty of each university. The sample calculus showed that 364 students should enter in the investigations, and were randomly selected.

The DC/TMD questionary (Index 1) was utilized. This was traduced to Spanish language (Index 2) and was validated in a pilot study with 30 students from the Central University of Ecuador, with the Cronbach Index and showed 78,96% of reliability, high reliability.

In addition to the DC/TMD, questions relevant to medical history were incorporated, such as level of physical activity or exercise, presence of allergies, if they had or were currentling under orthodontic treatment, experienced sleep or awake bruxism, TMD treatment, or any related symptom such as nausea, vomiting, phonophobia, and the presence of any trauma.

Faculty directors for each of the fore-mentioned universities signed an informed consent authorizing the participations of students. The questionnaire was applied to students in universities.

The statistic analysis was conducted using SPSS V22 software. Data was tabulated and described according to the number of symptoms reported compared to the genre, and submitted to the Chi square test. To determine the relation between the categorical variables, the Chi square test allowed for 5% error and with a confidence level of 95%.

Results

A total of 400 students were evaluated from the six universities (71% women and 29% men) (Table 1). Students were between 17-47 years old, with the majority between 17-22 years (67,3%), and then between 23-27 years (28%). Students of 17-22 years old reported facial pain in 69,2%, without statistical difference in relation to genre (p=0.3772). In regards to facial pain, 55% answered affirmative, being women (76%) and having statistical significance (p=0,007). As well as headache, 77% were women with statistical significance (p=0,004).

Table 1: Universities were the students were interviewed

	Frequency	%	Women	%	Men	%
USFQ	35	8.8	23	5,75	12	3
UDLA	74	18.5	47	11,75	27	6,75
UIDE	72	18.0	53	13,25	19	4,75
UTE	41	10.3	50	12,5	15	3,75
UCE	65	16.3	29	7,25	12	3
UNIANDES	113	28.3	82	20,5	31	7,75
Total	400	100.0	284	71	116	29

From the students evaluated, 55,3% referred facial pain and 53,5% pain in the temples of the head. In the last 30 days, 28% told that the facial pain is intermittent and 1,5% pain was always present. In relation to the beginning of the facial pain symptoms, 14,5% of the students reported to have pain between 1-3 years ago, 13% six months ago and 10,8% three months ago, while pain in the temples began three months ago in 17,8% and from 1 to 3 years ago in 10,3% of the students. Facial pain and pain in the temples did not have any association. (x2=0,246; p=0,62). Table 2 shows factors that modified facial and temple pain in the last 30 days.

Table 2: In the last 30 days, some of these activities modified your facial or temple pain to be better of worse?

In the last 30 days, some of these activities modified your facial pain, in the mandible region, ear of one side or another?		
	Frequency	%
No one	254	63,5
A) Chewing hard or tough food	36	9
B) Opening your mouth, moving your jaw forward or to the side	48	12

C) Jaw habits such as holding teeth together, clenching/ grinding teeth or gum.	36	9
D) Other jaw activities such as talking, kissing or jawning.	2	0,5
All of these activities	24	6
Total	400	100

In the last 30 days, some of these activities modified your temples pain, become better or worse?		
	Frequency	%
No one	280	70
A) Chewing hard or tough food	26	6,5
B) Opening your mouth, moving your jaw forward or to the side	18	4,5
C) Jaw habits such as holding teeth together, clenching/ grinding teeth or gum.	48	12
D) Other jaw activities such as talking, kissing or jawning.	11	2,8
All of this activities	17	4,3
Total	400	100

Sound, noises and closed locked of the TMJ, were also reported by students, 39,2% reported some kind of noise in the TMJ when opening their mouth, without difference between both sides, having 6,8% noise bilateral, 38,8% men and 39,4% of women reported having noises in the TMJ (p=0,879).

Closed locked was reported in 13% of the students without any difference between man and women (p=0,134), in which 7% had a serious locking to prevent mandibular movements. Interminent locking was reported by 5,2% of the students and 2,5% presented locking at the moment of answering the questionnaire. Open locked was present in 6% of the students, and 4,7% in the last 30 days had to perform some exercise to close the mouth and there was no gender difference.

When checking the relationship between pain in the mandible, ear, forehead on both sides and the presence of articular noise, 75% of the students did not report any noise or pain in the face. Among the patients who reported noise, 51% also reported facial pain, on the left (21%), right (20%) and on the sides (10%), this relationship was significant (p=0,000) (Table 3)

Table 3: Facial pain and noises in the temporomandibular joint

Was there any noise in the temporomandibular joint when you made any movement	Without facial pain		With facial pain		Total
	F	%	F	%	F
No one	135	75%	108	49%	243
Left	19	11%	47	21%	66
Right	20	11%	44	20%	64
Left and Right	5	3%	22	10%	27
Total	179		221		400

The relationship between pain in the mandible, ear or in front of the ear in both sides and the presence of locked mandible, 19% indicated mandible locked and pain bv presence, and it was significant (p=0,000) 95% of the students did not showed either mandible locked nor mandible pain. (Table 4)

Table 4: Presence of mandible pain and closed locking of the jaw

Have your ever had your jaw lock or catch, even for a moment, so that it would NOT open ALL THE WAY	Have you ever had pain in your jaw, temple, in the ear, or in the front of the ear on either side?				Total
	No		yes		
	F	%	F	%	F
No one	170	95%	178	81%	348
Left	3	2%	12	5%	15
Right	4	2%	13	6%	17
Left and Right	2	1%	18	8%	20
Total	179		221		400

Attachments 3-6 present data about level of physical activity, presence of allergies, orthodontic treatment, bruxism, treatment for TMD and associated symptoms. Physical activity seems to be associated with the absence of facial pain (x2=0,12; p<0.05), of headaches (x2=5,45; p<0.05), of jaw joint noises (x2=8,14; p<0,05) and closed locked of the jaw and open locking of the jaw (x2=7,24, p<0,05; x2=3,57, p<0,05). However, bruxism had relation with facial pain (x2=7,91, p<0,05), of headaches (x2=7,48; p<0.05), of jaw joint noises (x2=18,45; p<0,05). The report of headache presented a relationship with the symptoms such as nausea, vomito, fotophobia and osmophobia (x2=17,12; p=0,01).

Less of 5% of the students sought treatment for TMD, the most common being the installation of the intraoral appliance.

Discussion

This is the first epidemiology study of the symptoms of TMD in dentistry students of six faculties of Ecuador, using just the DC/TMD questionnaire, where it was analyzed TMD symptoms and was not made the physical exam, in order to close the diagnosis of the students in the three fundamental groups: Group I: muscular disorders, Group II: joint disorders, (disc dislocation) and Group III: inflammatory disorders or non-inflammatory (arthralgia / osteoarthritis or osteoarthrosis),1,4,8, but we obtained the prevalent subjective symptoms reported by the academics of Ecuador, which were facial pain, headache or temple pain, jaw joint noises, closed or opened locking of the jaw. This validates why it is important to make a complete physical evaluation to confirm the subjective data of TMD[9].

Thus, epidemiological data in the literature about signs and symptoms of TMD vary markedly, because of the changes in sample selection, of the criteria and methods used to collect the information from each of the researches thus have the Fonseca, Helkimo, Craniomandibular Index, RDC / TMD and DC / TMD15, 23. Studies show that in a literature review of 17 articles, 12% used the Helkimo Index, 24% RDC / TMD, 55% clinical protocols and 35% anamnesic questionnaires14. Using the Helkimo index, a TMD classification was obtained in healthy (58.71%), mild (34.84%), moderate (5.81%) or severe TMD (0.65%)9, and with the help of RDC / DTM in group I (56.4%), group II (42%) and group III (57.5%)[1].

Most of the students were between 17-27 years old, several authors indicate that the highest prevalence of TMD is between 20 to 40 years old of age, which is related to this research 1,9, 11,12, 16, 18, 23, 24 , 25 Also in the literature, the female gender presented the highest subjective TMD symptoms12,15,17, such as headache (77%) and facial pain (76%) [19,20].

The symptoms of jaw pain, headache, are more prevalent in women, and could be explained with the following theories, because they seek treatment more often than men, women have low modulation of pain, because of hormones related to menstrual cycle, estrogens which plays a key role in pain and that could worsen TMD pathology, because there are estrogens receptors in the TMJ and also because it

can influence the synthesis of collagen and elastin in the disc [6,9,10,12,17,24,27].

TMJ noises, mandibular closed locked or open locked did not differ between both genres 12 (p = 0.879, p = 0.134 and p = 224). Noises are a risk factor for TMD because it is a morphology disc change and mechanical disorders that can cause clicking without pain or significant dysfunction11. Structural changes in the surface of the jaw joint can be the cause for anterior displacement of the disc, and hypermobility of the disc condyle complex, as well as degenerative processes of TMJ that can cause crepitations. The noises were frequent in this work with 39.2%

The symptoms of TMD are prevalent in the general population but can be asymptomatic and therefore go unnoticed leading to a low percentage of patients to seek appropriate care in specialized clinics. In aggrement with the literature, this study found 4.5% of patients to seek care, being prevalent the use of intraoral device, medication and even occlusal adjustment, which nowadays it is known that occlusal factors have no causal relationship with TMD, but may be a consequence of TMJ pathologies [9,26].

Authors refers that there is comorbidity between TMD and headache, fortunately TMD treatment helps to reduce headache in some cases, in some others headache should be treated by a neurologist 11, 28. In this work, headaches were reported by 77% of women. The literature established headaches were present in 25-52% of adults and 2-5% of adolescents, and also explained that myofascial pain and tension-type headache share the same physiological mechanisms, and that this pathology is incapacitating for people and affects their quality of life[28,29].

Bruxism is a behavior and not a temporomandibular disorder and in order to identify, as a possible bruxism it is needed to use self-reports questionnaires, a likely bruxism with the clinical examination and for the definitive diagnosis it is through polisonography30. Thus, in this study, possible night bruxism was reported by 15.5% of the population, and 2.3% reported bruxism in wakefulness, and they may increase the risk of developing TMD because they increase the load on the articular surface, altering the biomechanics of TMJ11,[29].

On the other hand Gameiro7. (2006), reported that the sleep bruxism pattern seems to be unrelated to TMD, which causes to the scientific community to turn their eyes on to the relationship between awake bruxism and TMD. Though, it is necessary to develop standardized methods to better study night or awake bruxism[30].

The practice of physical activity is related to the presence of TMD, so sedentary individuals are at greater risk of developing TMD compared to those who exercise or who have a healthy active life31. On the other hand, the prevalence of signs and symptoms in adolescent athletes and non-athletes, women and men did not have a statistically significant difference between them, because they had a small and young group32, 33. Men are more active than women, which may explain why DTM is more frequent in women34. Stress can affect the biological process of pain and perception of pain7. We also have to consider that TMD has a multifactorial etiology with many variables involved, such as beginner, perpetuating and predisposing factors[35].

Epidemiological studies evaluate the frequency, distribution of the conditions related to health in a population as well as to a disease, and it is important to know the possible pathologies that could be established in a population so the necessity to create prevention or control programs7. Ecuador is a country that does not have much research in this branch of dentistry, Temporomandibular Disorder and Orofacial Pain, so dentists who treat patients with possible TMD are orthodontists or prosthetists, often without a surely knowledge that they are in front of a TMD diagnosis and the treatment is unclear, because this area is little known in Ecuador.

This investigation opens a new horizon to work on TMD in the Ecuadorian population, however with this work we know that students between the ages of 18-36 years have possible symptoms of TMD, so now we want and hope to enlarge the sample and to perform the DC/TMD questionnaire to search for symptoms of TMD and also the physical examination to obtain the signs of TMD, to have the prevalence of TMD and to be able to classify them in the three knows groups muscle, joint or inflammatory disorders, along with the psychosocial factors such as depression, somatization, catastrophization , stress. It is recommended to do more epidemiological research combining the physical and psychological factors on TMD.

Conclusion

The students of the dental schools of the universities of Ecuador have a high prevalence of TMD symptoms, more frequent in the female gender, however, less than 5% sought care. These data point to a greater dissemination of such problems to the population and the need for guidance on the need for specialized treatment.

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