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ORIGINAL RESEARCH

A Facility-Based Study of Severity of Pain Among Patients with Temporomandibular Myofascial Pain Syndrome

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Abstract

Background: Myofascial pain syndrome is the most common temporomandibular joint (TMJ) disorder.

Objective: To measure pain severity among patients with temporomandibular myofascial pain syndrome using the Visual Analogue Scale (VAS), and to relate pain severity to age and gender.

Methods: A cross-sectional study of patients who presented with TMJ pain and were diagnosed with TMJ myofascial pain syndrome was conducted. Data were collected using a structured questionnaire and were statistically analysed.

Results: Out of a total of 603 patients, 18 (3.0%) had temporomandibular myofascial pain syndrome. They were aged 22-78 years with female preponderance (11; 61.1%) and a female-to-male ratio of 1.6:1. The majority of the patients had mild pain (7/18; 38.9%). The mean VAS score for the patients in this study was 5.8±2.6. The female patients experienced more severe pain (5/11; 45.4%), compared to males.

Conclusion: There was a female preponderance in TMJ myofascial pain syndrome, with a mean VAS pain score of 5.8±2.6. Severe pain was mostly reported by female patients while the male patients often present with mild pain.

Keywords: Myofascial pain syndrome, Pain assessment, Temporomandibular joint, Visual Analogue Scale.

Introduction

Myofascial pain syndrome, previously known as Temporomandibular Joint Pain Dysfunction syndrome (TMJPD) or Facial arthromyalgia, is the most common temporomandibular disorder (TMD). [1] Pain within the temporomandibular joint and masticatory muscles is one cardinal sign and most common presentation of all

temporomandibular disorders. [2] The associated pain may be localized, referred to the ear, chin, and temporal regions and may present in varying intensities in different patients. Temporomandibular disorders are classified as either secondary to myofascial pain and dysfunction or secondary to true articular disease. The myofascial pain type of temporomandibular disorder is associated with

pain without destructive changes of the temporomandibular joint (TMJ) on the radiograph. [3]

The temporomandibular joint is a complex, load-bearing, bilateral synovial joint that is formed by the head of the condyle and the squamous part of the temporal bone. [4] The loss of normal functions of the joint such as mastication and speech, in association with pain, is characteristic of masticatory systemic disorders of which temporomandibular joint pain dysfunction syndrome (TMJPDS) is one. [1] Temporomandibular disorders may occur at any age but are more common in women and early adulthood. [5] Wright reported that 33% of the affected individuals had at least one TMD symptom, and about 3.6% to 7% had symptoms with sufficient severity to seek therapy. [1, 6] A relatively higher prevalence has been reported among Nigerians compared to Western societies. [7] In a Nigerian study, 26.3% and 46% of participants assessed with the Criteria of Helkimo had mild anamnestic and clinical dysfunction scores respectively. [7]

Myofascial pain syndrome is a pain disorder characterized by spontaneous pain and jaw function-induced pain in the joint and muscles of mastication of the TMJ, because of the interplay between the muscles and joints. A problem with either one can lead to stiffness, headaches, ear pain, malocclusion, clicking sounds, or trismus. It is a common but misunderstood muscular pain disorder involving pain referred from small, tender trigger points within myofascial structures in or distant from the area of pain. [8] The aetiology of this disorder includes tension, fatigue or spasm in the masticatory muscles, bruxism which increase the tear and wear on the cartilage lining of the TMJ, habitual gum chewing or fingernail biting, malocclusion and trauma to the jaws. Other aetiological factors include stress, occupational tasks such as holding the telephone between the head and shoulder, chewing and

yawning. [9] Although the definitive pathogenesis of the condition is currently unknown, and no single diagnostic method is consistently positive, it is commonly believed to be a stress-induced psychophysiological disease, originating in the muscles of mastication, and not an organic disease arising in the temporomandibular joint. [10] Several symptoms such as pain, biting or chewing difficulty, clicking or popping sounds, dull ache associated with the face, ear, head and neck have been associated with myofascial pain syndrome. The principal findings include tenderness of the TMJ and associated muscles of mastication, trismus, limited or jerky jaw movements, and evidence of bruxism (tooth wear). [11]

There have been previous studies and reports on temporomandibular joint pain dysfunction syndrome and temporomandibular joint disorders generally, reporting prevalence and patterns of presentations. [2,12 - 14] So far, no literature has attempted to assess pain severity specifically for TMJ myofascial pain syndrome. Therefore, this study aimed to measure the pain severity in patients with temporomandibular myofascial pain syndrome using the Visual Analogue Scale (VAS) and relate pain severity to age and gender.

Methods

The study was designed as a cross-sectional study, and it was conducted at the University of Benin Teaching Hospital (UBTH), Benin-City, Edo State, Nigeria, over a period of two years from March 2018 to February 2020. The permission to conduct the study was obtained from the Department of Oral Pathology and Medicine, UBTH, Benin-City and the tenets of the Declaration of Helsinki were adhered to. The participants were selected using convenience sampling method, and they included all consenting patients who presented to the Oral

Medicine Clinic on account of TMJ and associated muscular pain, usually of trigger points and confined within the boundaries of the muscles as proposed by Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) for Clinical and Research Applications, 2014. [15]

The data was collected using a structured questionnaire with two sections. The first section sought information on the socio-demographic characteristics of the respondents including age, gender and occupation. The second section obtained information on the assessment of pain severity.

Pain Assessment Scale

Objective assessment of the pain severity was done using the Visual Analog Scale (VAS) before treatment. Although the VAS is a validated tool, it is a subjective measure for acute and chronic pain. The scores were recorded by making a handwritten mark on a 10-cm (100 mm) line that represents a continuum between the two ends of the scale: “no pain” on the left side (0 cm) of the scale and the “worst pain” on the right side of the scale (10 cm). VAS score 0 was categorized as no pain, 1–3 cm as mild pain, 4–6 cm as moderate pain and 7–10 cm as severe pain. The measurements from the starting point (left end) of the scale to the patients' marks are recorded in centimetres and are interpreted as their pain severity. Each participant was asked to mark a point that best corresponded to the intensity of their pain. [16]

The VAS reliably assesses pain intensity and has been shown to have suitable validity and versatility. A scale of 10 cm VAS had the smallest measurement error, while the end-phrase ‘worst pain imaginable’ had the greatest sensitivity in measuring ‘present pain’ for acute dental pain. [16] In a comparative study of two different pain rating scales amongst 100 Nigerian patients using the VAS and Verbal Rating Scale (VRS), correlation analysis showed a significant positive

relationship between the VAS and VRS indicating that both VAS and VRS constituted useful tools for pain assessment among Nigerian patients. [17]

Statistical analysis

Data analysis was done using the Statistical Package of Social Sciences (SPSS 17) software. Frequency and percentages were used to describe the socio-demographic characteristics. Descriptive statistics in form of mean and standard deviation were used to describe quantitative data. The Pearson Chi-Square test was used to determine the association between categorical variables. Statistical significance was defined by *P*-value less than 0.05.

Results

Out of a total of 603 clinic attendees, 18 patients had temporomandibular myofascial pain syndrome giving a prevalence rate of 3.0%. There were 315 (52.2%) males and 288 (47.8%) females. The patients with temporomandibular myofascial pain syndrome were aged 22 to 78 years with the mean age (\pm SD) of 51.8 \pm 16.6 years, while the bulk of the patients (5/18; 27.8%) belonged to the 51-60 years age group. The gender distribution showed that 38.9% (7/18) of the patients with temporomandibular myofascial pain syndrome were males and this formed 2.2% of all the male clinic attendees during the study period. Similarly, 61.1% (11/18) of the patients were females and this represented 3.82% of the female clinic attendees. The female to male ratio was 1.6:1.

A majority of the 18 patients were civil servants (61.1%), 27.8% were traders while the remaining 11.1% were students. A greater proportion (44.4%) of the patients complained of pain from the right TMJ, while equal proportions had left-sided and bilateral TMJ pain. The duration of pain on presentation varied among participants:

38.9% each, reported pain of less than 4 weeks duration and greater than 12 weeks duration, while 22.2% participants have had pain for 4-8 weeks (Table I).

The mean VAS score for the patients was 5.8 ± 2.6 . Some of the patients (38.9%) on the first presentation had mild pain, 33.3% had severe pain, while the least proportion had moderate pain (27.8%) as shown in Table II. Considering the relationship between gender and pain severity, 45.4% (5/11) of the female patients had severe pain, while only a male patient (14.3%;

1/7) experienced severe pain. A higher proportion of male patients (57.1%) had mild pain. Gender was not significantly associated with pain severity ($p = 0.328$) (Table III).

In relating age to pain severity, 60.0% (3/5) of age group 51-60 years presented with mild pain, 1 participant each (20.0%) presented with moderate and severe pain. The only patient in the 21-30 years age group had severe pain, while each (33.3%) of the three members of the 41-50 years age group had mild, moderate and severe pain respectively (Table IV).

Table I: Demographic characteristics of 18 patients with temporomandibular myofascial pain syndrome

<i>Parameters</i>	<i>Frequency</i>	<i>Percentage</i>
Sex		
Male	7	38.9
Female	11	61.1
Age group (Years)		
21-30	1	5.6
31-40	4	22.2
41-50	3	16.7
51-60	5	27.8
61-70	3	16.7
>70	2	11.1
Occupation		
Civil Service	11	61.1
Trading	5	27.8
Schooling	2	11.1
TMJ laterality		
Right TMJ	8	44.4
Left TMJ	5	27.8
Bilateral	5	27.8
Duration of Pain (weeks)		
< 4	7	38.9
4-8	4	22.2
> 8-12	0	0.0
>12	7	38.9

Table II: Distribution of patients according to the severity of pain measured by the pain score

<i>Pain severity levels</i>	<i>Frequency</i>	<i>Percentage</i>
Mil	7	38.9
Moderate	5	27.8
Severe	6	33.3
Total	18	100.0

Table III: Relationship between sex and pain severity

<i>Pain severity</i>	<i>Sex</i>		<i>Total (%)</i>
	<i>Female (%)</i>	<i>Male (%)</i>	
Mild Pain	3 (27.3)	4 (57.1)	7 (38.9)
Moderate Pain	3 (27.3)	2 (28.6)	5 (27.8)
Severe Pain	5 (45.4)	1 (14.3)	6 (33.3)
Total	11 (100.0)	7 (100.0)	18 (100.0)

P = 0.328

Table IV: Relationship between age groups pain severity

<i>Age (Years)</i>	<i>Pain severity</i>			<i>Total (%)*</i>
	<i>Mild</i>	<i>Moderate</i>	<i>Severe</i>	
21-30	0 (0.0)	0 (0.0)	1 (100.0)	1 (100.0)
31-40	1 (25.0)	2 (50.0)	1 (25.0)	4 (100.0)
41-50	1 (33.3)	1 (33.3)	1 (33.3)	3 (100.0)
51-60	3 (60.0)	1 (20.0)	1 (20.0)	5 (100.0)
61-70	1 (33.3)	1 (33.3)	1 (33.3)	3 (100.0)
>70	1 (50.0)	0 (0.0)	1 (50.0)	2 (100.0)
Total	7 (38.9)	5 (27.8)	6 (33.3)	18 (100.0)

P = 0.215

Figures in parentheses are percentages calculated across the rows

*Percentages calculated across the column.

Among civil servants, 45.4% (5/11) had mild pain, while 27.3% (3/11) had moderate and severe pain respectively. An equal proportion of the traders (40.0%;2/5) had mild and severe pain, whereas 50.0% (1/2) of the students each reported moderate and severe pain. There was no significant association between occupation and pain severity (p = 0.215).

Discussion

Temporomandibular disorders commonly affect females than males. [2, 3, 14] Pain from these disorders may be unilateral or bilateral as reported in this study. [3] The present study also showed a female preponderance. The reasons behind the sexual disequilibrium in the prevalence rate of Temporomandibular Disorders (TMD) are not entirely clear, but the hormonal influence is a possibility. Both animal and human studies have suggested that sex hormones may predispose to TMJ dysfunction

and cartilaginous breakdown. [18] Elevated levels of oestrogen have been reported among patients with TMD. However, no definitive link between these hormones and causation of TMD has been established. [19] Nevertheless, few studies have also reported male preponderance. [13, 20] The actual reasons for these discrepancies remain largely unknown. However, gender differences in dental awareness of patients in the different locations of study may also be contributory.

The present study showed that pain was more prevalent in patients above 50 years of age. This is supported by a previous study done at a tertiary hospital in Nigeria in which pain was found to occur more in the sixth decade of life. [2] The reason for the rise in the frequencies of cases with age may be due to the fact most predisposing factors of TMJ pain such as stress, TMJ arthritis, and attrition are more common as age increases. [21] The decrease in the frequency of cases observed after 60 years of age in the present

study may be due to the fewer number of patients in that age group.

In the present study, pain assessment was performed before treatment. On presentation, 38.9% of the patients had mild pain, 27.8% with moderate pain, and 33.3% had severe pain. A majority of the patients (61.1%) had VAS of 5 and above, with a mean value of 5.8 ± 2.6 . This is similar to the finding in a previous study carried out in Nigeria by Oyetola, *et al.* [2] in which the majority of their patients had VAS of 5 before treatment. Similarly, a retrospective study conducted in Brazil by Poluha and colleagues reported a mean VAS pain score of 5.7 ± 1.84 . [22] This shows that most patients with TMJ myofascial pain syndrome usually present with pain of moderate-intensity, hence treatment modalities will be with varying conservative approaches including the use of analgesics, anxiolytics, muscle relaxants and relaxation techniques as recommended by other researchers elsewhere with a good outcome. [13, 23, 24] In contrast to the finding in the present study, a mean pain score of 8.45 ± 1.46 in the VSA was reported in a study by Gonzalez-Perez in a Spanish University Hospital. [25] The higher VAS pain score recorded in the present study may be explained by the pain mechanism of each condition as well as the role of peripheral and central sensitization.

The relationship between sex and the severity of TMJ myofascial pain syndrome was not significant in the present study, although, severe pain was more frequent among female patients, with most of the males presenting with mild pain on VAS assessment. This suggests that genetic factors may contribute to this observation, but no clear explanation has so far been offered. [26] Furthermore, an earlier study showed that females significantly had more pain on palpation than males, as reported by Bagis, *et al.* [27] More accurate studies on the differences of anatomical, physiological and histological features of the TMJ

of males and females need to be conducted to understand the reason for this difference in the adaptive capacity between genders. [28]

The occupation had little or no significant association with pain; the pattern of pain severity was almost uniform across the various occupations. The literature search did not reveal any study reporting a link between occupation and temporomandibular disorder; rather a higher risk was reported among women who worked more than sixty hours per week compared to those who worked less than 40 hours per week. [29] This difference may be attributable to stress. Similarly, age was not observed in the present study to be associated with the pattern of pain. Therefore, a larger-sized study is required to establish the relationship between age and severity of temporomandibular myofascial pain syndrome.

Conclusion

The present study showed a female preponderance of TMJ myofascial pain syndrome with a Mean Visual Analogue scale value of 5.8 ± 2.6 . Severe pain was mostly reported by female patients while most of the male patients had mild pain. This present study should serve as a pilot study for further research into temporomandibular myofascial pain assessment and the clinical factors affecting pain severity.

Authors' Contributions: OM and ON conceived and designed the study and did data collection, analysis and interpretation. AO participated in data collection, analysis and interpretation. OM, ON, and AO drafted the manuscript. OD revised the draft of the manuscript for sound intellectual content. All the authors approved the final version of the manuscript.

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