IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 24, Issue 12 Ser. 3 (December. 2025), PP 42-47
www.iosrjournals.org

More Severe Somatization Is Associated With More Chronic Tension-Type Headache In Subjects With Temporomandibular Disorders And Concomitant Tension-Type Headache.

Ed W. César, Omar F. Molina, Bruno Simião, Maria A. Sobreiro, Tito Molina, Isadora Tatim

Restorative Dentistry Division, UNIRG University Dental School, Gurupi -TO, Brazil.
Private Practice In Orofacial Pain, Gurupi -TO, Brazil
Prosthodontics Division UNIRG University Dental School, Gurupi -TO, Brazil
Anatomy Division UNIRG University Dental School, Gurupi -TO, Brazil (Retired)
Graduate Student Oral And Maxillofacial Surgery, Puerto Rico University, USA.
Undergraduate Student UNIRG University Dental School, Gurupi -TO, Brazil

Abstract:
Introduction: *Temporomandibular disorders constitute a set of signs and symptoms of musculoskeletal origin sometimes associated with acute or chronic migraine, chronic daily headache and tension-type headache. There is a paucity of research about chronic tension-type headache in subjects with temporomandibular disorders and headache.*
Aim: *Test the hypothesis that subjects with temporomandibular disorders and severe or very severe somatization demonstrate more chronic tension-type headache.*
Methods: *A retrospective investigation in subjects with signs and symptoms of TMDs, Tension-Type Headache was carried out. Clinical evaluation, palpation of joints and muscles, history of the chief complaint and description of pain, criteria for tension-type headache and temporomandibular disorders, assessment of bruxing behavior and biomechanical tests to diagnose internal derangements of the temporomandibular joints were used in subjects referred consecutively to a university-based center. Records were stored in a database for future retrospective studies. The database was used recently to retrieve consecutively the clinical records of 61 subjects with TMDs, TTH and data about somatization based on the Rief and Hiller instrument. Data about somatization was used to grade subjects with temporomandibular disorders and controls in those with no (0—2), mild (3—5), moderate (6—11), severe (12—16) and very severe (17 or higher) scores in somatization. One group with Temporomandibular disorders, tension-type headache and severe scores in somatization was used as the experimental group whereas another group with no temporomandibular disorders and with tension type headache was combined with another group with temporomandibular disorders, tension-type headache and 0—5 scores in somatization to form the control group. Data were analyzed using basic statistics (mean, standard deviation and range) and Mann-Whitney statistics with Well correction. Significance was accepted if $p<0,05$.*
Outcome: *Mean age in the experimental group was about 32,7 (SD=12,3, Range=14-66=) and 29,4 (SD=11,8, Range=11-60. Unpaired t-test with Welch´s correction p=0,12, a statistically nonsignificant difference). Mean in somatization was about 16,1 (SD=3,3, Range=12-24) in the experimental group and 5,6 (SD=3,5, Range=1-14 in the control group. Mann-Whitney test $p<0,0001$, an extremely statistically significant difference. Mean chronicity of TTH was about 83,9 months (SD=84,2, Range=8-420) in the experimental group and 54,3 months (SD=48,2, Range=1-225) in the control group. Mann -Whitney statistics, $p<0,04$, a statistically significant difference.*
Conclusion: *Somatization is a psychiatric disorder frequently observed in subjects with temporomandibular disorders and tension-type headache. There is a strong association between the chronicity of tension-type headache and severe somatization in subjects with temporomandibular disorders and tension-type headache.*
Keywords: *Temporomandibular Disorders. Tension-Type Headache. Severe Somatization. Chronic Pain.*

Date of Submission: 02-12-2025 Date of Acceptance: 12-12-2025

I. Introduction

Temporomandibular Disorders or TMDs is a common orofacial pain disorder that includes a number of clinical problems involving the masticatory muscles, temporomandibular joints (TMJs) and adjacent anatomic

structures usually of musculoskeletal origin [1]. TMDs constitute a group of dysfunctions and disorders related to impaired function of the TMJ and masticatory muscles characterized mainly by pain and function impairment of the musculoskeletal components of the masticatory system [2]. TMDs are found in approximately 10% of the population, their frequency varies greatly according to the population being investigated [3]. The frequency, intensity and degree of disability in TMDs patients is greatly influenced by psychological factors including anxiety, stress, depression and somatization. Signs and symptoms of TMDs are observed in children, adolescent and adults, but they predominate in females between the ages of 20-40 [4]. Chronic Tension-Type Headache (TTH) is found frequently in groups of patients presenting with chronic TMDs. Many studies have demonstrated shared signs and symptoms of chronic TTH and TMDs including severe pain and chronic pain complaints, bruxism, somatization, anxiety and depression [1]. Signs and symptoms of TMDs include a complaint of musculoskeletal pain, joint noises, tenderness to palpation, difficulties to perform physiologic jaw movements and headache [5].

TTH may be chronic or acute and is described as a bilateral pain sensation occurring in the temple and frontal areas, mild or moderate in intensity, dull, aching, continuous lasting hours or days, with nausea reported occasionally and usually associated with pain, tension and stiffness in the cervical area and with chronic trigger points and myofascial pain. There is a close association between TMDs and TTH, but the mechanisms explaining such association remain unknown [1]. Chronic headache is observed very frequently in subjects presenting with signs and symptoms of TMDs. Most common headaches include TTH, migraine and combination headache. Such disorders frequently co-occur with anxiety, depression and somatization. Patients with chronic and incapacitating pain and headache are more likely to report signs and symptoms of depression, more intense pain and nonspecific symptoms indicating somatization. Chronic pain in TMDs can be associated with more frequent somatization including painful symptoms [6]

Somatization is defined as the "displacement of psychological conflicts to the somatic sphere where they are represented in the form of multiple complaints including chronic musculoskeletal pain". Physical complaints in somatization cannot be explained clearly by physical illness [3]. Based on a review of the literature, one investigation indicated that somatization is directly associated with pain related disability, widespread pain, increased frequency of headache, undesirable life events, illness behavior, depression and treatment-seeking behavior [7] Psychiatric disorders including anxiety, depression and somatization are found frequently in patients presenting with complaints of TMDs. Anxiety, depression and somatization facilitate, induce or reinforce the development of chronic pain including TMDs and headaches [8]. Moderate and severe signs and symptoms of somatization are observed frequently in TMD patients presenting with signs and symptoms of myofascial pain and TMJ internal derangements (TMJ-IDs) [9]. Severe somatization significantly alters the masticatory system causing limitations in jaw function and more frequent and severe muscle pain [10]. Somatization is a psychiatric disorder closely associated with anxiety, depression, bruxing behavior and may modulate the severity of headache. Because severe somatization and psychological distress may negatively influence the clinical presentation of both TMDs and TTH, in this investigation we test the hypothesis of increased chronicity of both TMJ pain and TTH in patients with TMDs, TTH and severe somatization.

II. Material And Methods

Sample

The experimental group in the current study was obtained from the clinical records of subjects that had been evaluated comprehensively using clinical, biomechanical and psychological tests. Following comprehensive evaluation their clinical records were stored for future studies. Recently, and using alphabetical order, the clinical records of 61 subjects with information about TMDs, TTH and somatization were retrieved consecutively and constituted the experimental group. The clinical records of subjects with no TMDs but with information about TTH and those with TMDs + TTH + mild or no somatization according to the use of 32 items from the Rief and Hiller questionnaire were also retrieved consecutively and constituted the control group (69 subjects). The method of evaluation used before designing and starting the current retrospective study based on the clinical records is described as follows:

Subjects and controls were examined comprehensively. History of the chief complaint, description of pain, palpation of muscles and joints, use of biomechanical tests to diagnose the type of TMJ internal derangement (TMJ-ID), evaluation of pain sites adjacent and or distant to the masticatory system, description of headache to diagnose TTH, migraine and combination headache, questionnaires for bruxing behavior, and 32 items of the Rief and Hiller questionnaire were used to gather clinical and psychological data about somatization, internal derangements of the TMJ, diurnal and nocturnal bruxism and headache type. The next step in this procedure was to examine data including scores in bruxing behavior and somatization so as to assign subjects to an experimental group (those with a diagnose of TMDs, TTH and severe scores in somatization) or those in a combined group of subjects with no TMDs and with TTH plus those with TMDs + TTH with 0-5 scores in somatization with the assumption that such combined sets of subjects would demonstrate a lower chronicity of TTH. In summary, the experimental group (n=61) was constituted by subjects with TMDs, TTH and high scores in somatization and the

control group (n=69) by subjects with no TMDs and with TTH and by those with TMDs, TTH but very low scores (0-5) in somatization.

Inclusion criteria for subjects in the experimental group: Presence of signs and symptoms of TMD, TTH and high scores in somatization (12 or higher).

Inclusion criteria for subjects in the control group: Clinical records from control subjects (n=69) were those retrieved consecutively from a database in the same period of time. One subgroup of these subjects was constituted by those with no TMDs but with signs and symptoms of TTH and by those with both TMDs and TTH but with no or with very low scores in somatization. The objective of this procedure was to form a subgroup with no or with TMDs but with signs and symptoms of TTH and low scores in somatization with the assumption that low scores in somatization would be observed in parallel with low scores in chronicity of TTH in the control group and high scores in the chronicity of TTH in the experimental one.

Inclusion Criteria for TMDs: Seeking treatment for TMDs, a complaint of pain in the masticatory muscles and/or in the TMJs, joint noises, tenderness to palpation of the masticatory muscles and difficulties to perform normal functional jaw movements. These signs, symptoms and characteristics are those that are usually present in TMD patients according to many investigations.

Inclusion Criteria for TTH: Pain reported in the temporal and/or frontal regions described as dull, aching, pressing, compressing or tightening and/or band-like, bilateral, lasting hours or days, sometimes associated with nausea and rarely with vomiting, usually mild or moderate in intensity most frequently occurring at the end of the day.

Inclusion Criteria for severe somatization: Thirty-two questions from the Rief and Hiller instrument[11,12] were used to evaluate levels of somatization in experimental and control subjects. For those who responded the self-reported questionnaire, those reporting 0-2, 3-5, 6-11, 12-16 and 17 or higher were diagnosed as demonstrating no, mild, moderate, severe and very severe somatization, respectively. Those subjects presenting with signs and symptoms of TMDs, TTH and 12-16 or 17 or higher scores in somatization were included as experimental subjects and the chronicity of TTH was evaluated in months. Controls were those subjects with no TMDs, but with signs and symptoms of TTH and those with TMDs + TTH with 0-5 scores in somatization, assuming that chronicity of TTH in these subjects would be lower as a function of their low scores in somatization as compared to those in the experimental group.

The Rief and Hiller instrument for somatization [11,12]: Thirty-wo questions from the Rief and Hiller questionnaire were used to gather data about somatization.

Exclusion Criteria: Subjects presenting with motor disorders, cognitive difficulties to respond properly to questionnaires and/or psychological or psychiatric disorders were not included neither as experimental subjects nor as control ones.

III. Data Analysis

Data were analyzed using basic statistics (mean, standard deviation and range). Age differences between the experimental and control group were analyzed using unpaired t-test with Welch´s correction. Mann and Whitney statistics was used to evaluated significance in the comparison of means in somatization and chronicity of TTH in the experimental and control groups. Significance was accepted if $p<0,005$.

IV. Outcome

This investigation evaluated and compared a group of 61 subjects presenting with signs and symptoms of TMDs, TTH and severe and very severe scores in somatization with another pooled control subgroup of 69 subjects presenting with No TMDs + TTH or with TMDs + TTH and 0-5 scores in somatization (n=69). This procedure was adopted in order to have subjects with TMDs and TTH and high scores in somatization in the experimental group and subjects with no TMD + TTH or subjects with TMDs and TTH but with low scores in somatization, being high scores in chronicity of TTH the independent variable to be tested. Put it in another way, the major objective was to compare subjects with high scores in somatization in the experimental groups with subjects with low scores in somatization in the control group, being chronicity of TTH the independent variable to be tested in both groups with the assumption that the frequency of subjects with more chronic TTH would be higher and statistically significant in the group with high scores in somatization.

Mean age in the experimental group was about 32,7 (SD=12,3, range=14-66) as compared to 29,4 (SD=11,8, range=11-60) in the control subgroup. Unpaired t-test with Welch´s correction p=0,12 indicated that age was not statistically significant and different in these two groups. See Table 1 for additional details. Mean in somatization was about 16,08 (SD=3,3, range=12—16) in the experimental group as compared to 5,6 (SD=3,5, range=1—14= in the control group. Because Mann and Whitney statistics (p<0,0001), it can be stated that there was a statistical and extremely significant difference in the comparison of both groups. This very statistically significant difference was expected as subjects in the experimental group were those with high or very high scores in somatization whereas even though TTH pain was also present in the control group, low scores in somatization would result in low scores in the chronicity of TTH.

Mean chronicity of TTH (in months) in the experimental group presenting with TMDs, TTH and higher or very high scores in somatization was about 83,9 months (SD=84,2, range=8-420) as compared to 54,3 (SD=48,2, range= 1-225) in the control subgroup. Because Mann—Whitney statistics (p<0,04), it can be stated that there was a statistically significant difference in chronicity of TTH in the comparison of both groups. Subjects with TMDs, TTH and high or very high scores in somatization demonstrated a more chronic TTH than the control group. See Table 2 for further details.

V. Discussion

More frequent reports of TTH of longer duration were found in the subgroup of TMDs and TTH subjects with severe or very severe somatization indicating a close relationship between higher scores in somatization and more chronic TTH.

One goal of the current investigation was to evaluate a potential correlation between more severe somatization and more chronic tension-type headache in subjects with TMDs and TTH. Higher and statistically significant scores in chronicity of TTH signs and symptoms using months as unit of time, were observed in a relatively large subgroup of TMDs subjects presenting with TTH and severe and very severe scores in somatization. Further, using a novel system to grade the severity of somatization, a previous investigation in our laboratory found that severe and more severe somatization occurred frequently in TMD and TTH subjects whereas mild somatization was more commonly observed in control no TTH and no TMD subjects.

Because higher scores in somatization occurred in paralleled with higher scores in chronicity of TTH in TMDs and TTH subjects, it seems apparent that somatization is not only a frequent psychiatric disorder in headache patients but has a major role contributing with longer chronicity of signs and symptoms. These findings and considerations are in line with one investigation [13] reporting that migraine and TTH are often accompanied by psychiatric disorders. Somatization and anxiety are reported frequently in patients with headache and they contribute to both severity and chronicity of signs and symptoms operating through the mechanisms of somatosensory amplification [13] and catastrophizing [14]. TMDs usually co-occur with other pain disorders in a subset of TMD subjects. Such individuals present with signs and symptoms of headache, cervical disorders, regional myofascial pain, physical expression of somatization including multiple painful sites and psychological distress. This point of view is shared by researchers in one investigation [15] indicating that some dysfunctional TMD patients present with signs and symptoms of many pain disorders that reinforce each other. Thus, there is a correlation between intensity of pain and chronicity, and between chronicity of TTH and severity of somatization as demonstrated in the current investigation. Further, somatization as an expression of the internalization of personal problems and distress, occur even in adolescents, is comorbid with depression and headache and may become chronic in many individuals [16]. Somatization contributes with a more chronic headache disorder, for instance, migraine or TTH. Additional support for the outcome in the current investigation comes from a similar investigation [1] in subjects with chronic TMDs and TTH, reporting that there is an association between chronic TTH coexistent with chronic TMDs and severe depression and somatization. The terms “facial pain” has been coined to represent both muscle and TMJ disorders. On the other hand, the term “chronic daily headache” is used to indicate the presence of a combination of TTH, migraine and medication overuse headache. TMDs can be found frequently in subjects presenting with both migraine and TTH. Thus, these considerations cohere well with one study [17] indicating that there is an overrepresentation of psychological symptoms in several pain conditions, more specifically in subjects with chronic daily headache and facial pain disorders. Further and consistent support to the outcome in the current investigation comes from one study [1] in chronic TMDs subjects in which researchers reported a high frequency of severe somatization in the TMD patient’s subgroup presenting with chronic TTH. Further, they asserted that chronic TTH was significantly associated with severe depression, somatization and high pain-related disability.

Factors contributing to more chronic headache and TMDs in patients with more severe somatization. Many factors may play a major role contributing to the transformation of acute to chronic TTH. Such factors include but are not restricted to anxiety, depression, catastrophizing, pain amplification, central sensitization, myofascial pain and trigger points in multiple anatomic areas, incomplete treatment, excessive use of medications, chronic somatization symptoms and ignore the importance of psychiatric factors in such a way

that the patient is not or is referred late to a psychologist or psychiatrists. These observations are congruent with one investigation [18] in patients with severe and enduring somatoform disorders presenting with multiple, recurrent and frequently changing physical symptoms that have persisted for many years before referring the patient to such professionals [18]. Somatic symptom disorders are generally chronic, their prevalence is high in the general population, many patients report improvement of their signs and symptoms, but in some patients, their health status deteriorates [19].

Signs and symptoms of somatization occur more commonly in patients with chronic migraine and chronic daily headaches, with more frequent and severe attacks and with associated anxiety and depression [20]. The association between higher scores in somatization in TMDs and TTH subjects found in the current study is in line with one investigation [21] indicating that there is a strong association between chronic, depression and somatization in TMDs pain. Psychological and behavioral factors that induce a chronic state of pain does not restrict to the presence of anxiety, depression and somatization. Others associated factors include the role of stress, catastrophizing, a negative belief system and even destructive family relationships. Some support for these considerations comes from one investigation [22] indicating that anxiety and mood disorders can be observed frequently in patients with TTH. In this investigation [22], researchers reported a frequency of 21.7% of somatoform disorders and 77,8% of any psychiatry comorbidity, suggesting that psychiatric comorbidity constitute a complex contribution to the initiation, maintenance and transformation into a state of chronic TTH. Further, the transformation of acute into chronic TMDs is closely associated with a combination of psychological or psychiatric disorders including depression, somatization, affective distress, fear of pain, catastrophizing and characteristics of pain amplification [23], a common contributor to psychosomatic disease.

Even though those researchers did no evaluate the prevalence of TTH and migraine in that investigation, it is implicit that a high frequency of migraine, TTH and combination headache can be found in samples of subjects presenting with signs and symptoms of chronic TMDs. Additional support to the outcome in the current study comes from one investigation [21] in TMDs subjects with chronic pain, depression and somatization indicating that there is a positive association between chronic TMDs pain, somatization and myofascial pain in the masticatory system.

Clinical applications

Based on the outcome reported in this investigation in a group of subjects with severe somatization and more chronic TTH and TMDs, it seems apparent that clinicians should expect higher scores in somatization, depression and anxiety during assessment of chronic cases of TMDs and TTH subjects. In the same line, a profile of chronic TMDs and TTH combined with more severe TMDs signs and symptoms, anxiety and depression in those with severe scores in somatization should be expected. Such clinical and psychological profile is closely related to more difficulties with treatment and with the need to use a multidisciplinary approach including psychological, psychiatric and pharmacological treatment. Further, the evaluation of chronic cases presenting with TMDs, headache and psychological distress including chronic somatization should be comprehensive. Thus, soon before initiating treatment, patients should be referred for psychological and psychiatric assessment, so as to elaborate a plan of treatment that includes management of psychological, psychiatric and behavioral aspects of the psychological and orofacial pain profile of such patients.

VI. Conclusion

TMDs constitute a set of signs and symptoms in which pain and impairment of jaw movements predominate. Various headaches types including migraine, tension-type headache and combination headache can be observed in groups of subjects with TMDs. Different levels or grades of somatization can also be observed in such subjects using appropriate psychological instruments. In the current investigation it was found that subjects with TMDs and more severe somatization scores demonstrated more chronic signs and symptoms of TTH. Subjects with these clinical characteristics constitute a clinical challenge regarding both diagnosis and treatment. A multidisciplinary approach for diagnosis and treatment is highly recommended.

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Table 1. Social and demographic information in the experimental group of TMDs and TTH subjects with severe and very severe scores in somatization (n=61) and in the pooled group of No TMDs and TTH and TMDs + TTH subjects with 0-5 scores in somatization (n=69).

	Experimental subjects n=61	Control subjects n=69
Age		
Mean	32,7	29,4*
SD	12,3	11,8
Range	14-66	11-60
GENRE		
Females	60=98,4	56=81,2%
Males	1 =1,6	13=18,8%
Totals	61=100%	69=100%

*Unpaired t-test with Welch´s correction p=0,12: Regarding age, the groups are not significantly and statistically different.

Table 2: Data about scores in somatization and chronicity of TTH in the experimental group (TMDs + TTH subject with 12 or higher scores in somatization, n=61) and in the pooled control of subjects with no TMDs + TTH and of subjects with TMDs + TTH and 0-5 scores in somatization n=69).

Somatization/chronicity	Experimental subjects=61	Controls=69
SOMATIZATION		
Mean	16,08	5,6**
SD	3,3	3,5
Range	12—16	1—14
CHRONICITY OF TTH		
Mean	83,98	54,3***
SD	84,2	48,2
Range	8-420	1-225

**Mann-Whitney statistics p<0,0001, (considered a statistically extremely significant difference).
***Mann-Whitney statistics p<0,04, considered a statistically significant difference.