

## The modulating effect of bruxism as a form of suppressed hostility on depression in a selected population of tension type headache (TTHa) and craniomandibular disorders (CMDs) individuals.

*O efeito modulador do bruxismo como uma forma de hostilidade reprimida numa população seleta com dor de cabeça por tensão muscular e distúrbios craniomandibulares (DCMS).*

Omar Franklin Molina <sup>1</sup>  
Marcus Sobreira Peixoto <sup>2</sup>  
Raphael Navarro Aquilino <sup>3</sup>  
Rise Rank <sup>4</sup>

Artigo  
Original

Original  
Paper

Recebido em  
06/2010

Aprovado em  
04/2011

### Key words:

Craniomandibular  
disorders

Tension-type  
headache

Bruxism

Depression

### Abstract

*AIMS: explore the hypothesis that bruxism and depression are forms of suppressed hostility in individuals presenting Craniomandibular Disorders (CMDs) and Tension-type Headache (TTHa). METHODS: We evaluated a group of 100 Craniomandibular Disorders and Tension-Type Headache individuals, a group of 38 CMDs and Facial Pain individuals and a group of 23 No Craniomandibular Disorders No Facial Pain individuals. Clinical examination, questionnaires, history of signs and symptoms, the Beck Depression Inventory (BDI) and the Cook-Medley Inventory (HO) were used to gather data. RESULTS: The frequency of Tension Type Headache was about 43.5% in the group of 230 Craniomandibular Disorder patients. Mean scores in hostility were 19.0, 17.7 and 17.2 in the groups presenting Tension-Type Headache and CMDs, CMDs and Facial Pain and No CMDs no Pain, respectively. Mean scores in depression were about 12.0, 9.1 and 5.7 respectively in the same groups. Mean scores in bruxism were about 12.9, 8.2 and 6.8, respectively in the same groups. The strongest correlation between bruxism and depression were observed in the TTHa group ( $r=0.4$ ,  $p<0.0001$ ) and in the Non CMD Non Pain group ( $r=0.48$ ,  $p<0.02$ ). CONCLUSION: Depression is a better indicator of hostility in subgroups presenting TTHa. Scores in bruxism and depression as a form of suppressed hostility are higher in CMDs and TTHa individuals than in controls without TTHa. Because scores in bruxism were higher in TTHa and CMDs individuals, there is a strong and positive association between bruxism and TTHa in individuals with concomitant Craniomandibular disorders.*

<sup>1</sup> Post Doctoral in Orofacial Pain (Harvard University), MDS, PA, Professor of Orofacial Pain, School of Dentistry, UNIRG-TO.

<sup>2</sup> MDS, Ph.D in Orthodontics, UNESP, Professor of Orthodontics, Dean UNIRG-TO.

<sup>3</sup> MDS, Ph.D (Radiology-UNICAMP), Professor of Radiology, UNIRG-TO.

<sup>4</sup> MDS, Dean, School of Dentistry, UNIRG, Tocantins.

**Resumo**

**OBJETIVOS:** Testar a hipótese de que o bruxismo e a depressão são formas de hostilidade reprimida em indivíduos que apresentam Distúrbios Cranio-mandibulares (DCMs) e Dor de cabeça por tensão muscular (DCT). **MÉTODOS:** De um grupo de 230 pacientes com Distúrbios Cranio-mandibulares (DCMs), nos selecionamos todos os indivíduos que apresentavam dor de cabeça por tensão muscular (n=100). 38 indivíduos com DCMs e Dores faciais e 23 indivíduos sem DCMs e Sem dor, foram avaliados como grupos controles. História dos sinais e sintomas, exame clínico, questionários clínicos, o questionário de Beck para depressão e o de Cook-Medley para hostilidade, foram utilizados para recolher dados. **RESULTADOS:** A frequência de dor de cabeça por tensão muscular (DCT) foi de 43.5% no grupo de indivíduos com DCMs. Os valores médios em hostilidade foram de 19.0, 17.7 e 17.2 nos grupos com DCM+DCT, DCMs + Dor Facial e Sem DCMs e Sem Dor Facial, respectivamente. Os valores médios em depressão foram 12.0, 9.1 e 5.7 respectivamente nos mesmos grupos. Os valores médios em bruxismo foram 12.9, 8.2 e 6.8 respectivamente nos mesmos grupos. As correlações mais fortes entre bruxismo e depressão foram observadas nos grupos com DCT ( $r=0.4$  e  $p<0.0001$ ) e no grupo Sem DCMs e Sem Dor ( $r=0.48$ ,  $p<0.02$ ). **CONCLUSÕES:** Já que os valores em hostilidade foram similares, mas os valores em depressão e bruxismo foram diferentes nos 3 grupos avaliados, os valores em depressão constituem um indicador melhor da hostilidade em subgrupos que apresentam Dor de cabeça por tensão muscular. Os valores em bruxismo e depressão como uma forma de hostilidade reprimida, são mais altos em indivíduos com Dor de cabeça por tensão muscular e DCMs do que em indivíduos com DCMs e Dor Facial e Sem DCMs e Sem dor. Já que os valores em bruxismo foram mais altos no grupo com DCT e com Distúrbios Cranio-mandibulares, existe uma associação muito forte entre bruxismo e DCT em indivíduos que apresentam Distúrbios Cranio-mandibulares concomitantes.

**Palavras-chave:***Distúrbios Cranio-mandibulares**Dor de Cabeça por Tensão Muscular**Bruxismo**Depressão***1. Introduction**

Tension-type headache (TTHa) typically causes pain that radiates in a band-like fashion bilaterally from the forehead to the occiput. Pain often radiates to the neck muscles and is described as tightness, pressure, or dull ache (1). The International Headache Society defines tension-type headache more precisely, separates the episodic from the chronic form and divides such headache in the form associated with a disorder of the pericranial muscles and the form not associated. A serious problem in studying TTHa is the possibility of mistaking such headache with migraine, unilateral miofascial headache and combination headache (2). Tension type headaches often occur bilaterally and are felt in the occipital or temporal region and are often aggravated by prolonged immobility of the neck such as when driving or working with the head flexed (3). Tension type headache is usually felt like a tightening on both sides of the head. Pain episodes can last for minutes, hours or days and can happen frequently.

Pain episodes are described as constant, dull, aching pain unassociated with other symptoms (4). Tension headaches are often the result of stress or bad posture, which causes tightening of the muscles of the neck and scalp (5).

**2. Literature review**

Anger and hostility are implicated in the development and maintenance of chronic pain and it has been reported that patients with various chronic pain disorders are characterized by high levels of trait anger and hostility. Some findings including the tendency to suppress anger or externalize angry feelings seems to be a robust determinant of chronic pain severity (6). The tendency to suppress anger was noted many decades ago by Engels in his study of chronic facial pain patients who also presented higher levels of depression and it has been suggested that suppression of anger is more common in pain populations than in non pain controls (7). Research (8), indicates that physical stress, frustration and anxiety

can lead to frequent and intense or low level but sustained muscular contractions which in turn increase pain through ischemia and hypoxia (9). Anger management style and hostility are related to individual differences in physiological reactivity to stress (10). For instance, psychosomatic patients may react with symptoms in stress situations when compared with non psychosomatic controls.

Pain involves both a sensory and an affective component. Negative affect is a construct involving anxiety, depression and anger. These emotions can influence the likelihood an individual will experience in a headache attack (11). Even though a relationship between hostility and depression has been well established, the way tension type headache, depression, hostility and bruxism are interrelated is still intriguing. For instance, it is not known how bruxism as a form of suppressed anger presents and interacts in headache patients and controls.

The goals of this study are to test the working hypothesis as follows: 1. In CMD/TTHa, CMD+Facial pain and a non/pain control groups, the level of hostility will not be different in these three groups as hostility is suppressed and is presented in the form of bruxing behavior; 2. If bruxism is closely associated with depression which reflects hostility inward, scores in depression will vary significantly in these three groups. 3. If bruxism is a form of suppressed hostility, more severe bruxism will be present in TTHa patients and will correlate positively with higher levels of depression.

### 3. Materials and Methods

Material of this study was obtained from a selected populations of 230 craniomandibular disorders (CMDs) patients referred consecutively over a period of seven years to UNIRG Center for the study of CMDs and Bruxism for assessment and treatment. The charts of all patients presenting CMDs, TTH and bruxing behavior were retrieved and evaluated retrospectively. Information regarding CMDs signs and symptoms, bruxing behavior, and specific characteristics of Tension Type Headache was obtained by using a comprehensive protocol including:

1. History of chief complaint and signs and symptoms of CMDs and headaches
2. Questionnaires to assess bruxing behavior, which allowed us to classify bruxers as suffering from mild, moderate, severe, and extreme bruxing behavior
3. A comprehensive questionnaire for headache which allowed us to classify CMD/headache patients as suffering from tension-type headache (TTH), migraine headache, combination headache and myofascial headache different from TTH.
4. Clinical examination including palpation of the masticatory and cervical muscles to complement TTH diagnosis. The temporomandibular joints (TMJs) were palpated and joints sounds were assessed with a stethoscope. Jaw movements and the occlusion were also assessed. Initially, patients referred for examination and treatment were classified as presenting CMDs according to a previous publication (12). Then, with the information from questionnaires for bruxing and headache and clinical examination, patients were diagnosed as suffering or not from bruxism and headaches. Severity of bruxism and headache type were then diagnosed. All patients (N=100) presenting tension type headache were separated to form the "TTH group". A group of 38 patients presenting CMDs + facial pain without headache was also separated to form the first control group (A). The second control group (Control B), consisted of individuals referred to the same center in the same period of time, presenting neither craniomandibular disorders, nor facial pain. Inclusion and exclusion criteria were established to diagnose individuals as presenting CMDs, mild, moderate, severe and extreme bruxing behavior, and tension type headache.

Exclusion criteria for patients in this study: Presence of neurological and major psychological/psychiatric disorders, use of antipsychotic medication and severe and generalized muscle disorders, for instance, Parkinson Disease. Inclusion criteria for CMDs individuals were those described as follows: Seeking active treatment for a

muscle/TMJ disorder, presence of pain in the masticatory muscles and temporomandibular joints, failure of previous modes of therapy and difficulties to perform normal jaw movements. Because this study was based on data from retrospective patients' charts (2003-2009) from UNIRG Department of Orofacial Pain and Craniomandibular disorders, this study offered no risk for the patient.

Criteria for Craniomandibular Disorders: two or more of the following: a complaint of pain in the masticatory muscles and/or temporomandibular joints, pain on palpation of the masticatory muscles, tenderness in such muscles to gentle palpation, presence of joint noises reported by patients and confirmed with the use of a stethoscope placed laterally over the lateral area of the TMJ and headache of craniomandibular (CMD) origin. CMD patients were classified as presenting no bruxism (0-2), mild (3-5), moderate (6-10), severe (11-15) and extreme bruxism (16-24) signs and symptoms according to a scale published previously (13). Such scale is very useful clinically as the use of patients' report and clinical examination allows the examiner to assess a full range of bruxism severities.

The diagnosis of Tension-type headache was established as follows: a sensation of tightness, pressure or constriction which varies in intensity, frequency and duration, pain occurring invariably bilaterally in the nuchal, occipital frontal or temporal regions, pain mostly described as mild or moderate, nonpulsatile, without prodrome and lasting hours or days (14). Other characteristics to accept patients as presenting TTHa included bilateral pain not worsening with physical activities, nausea is not usually a symptom, presence of sensitivity to light in some patients and absence of vomiting (15).

Because TTHa may be very similar to combination headache (CoHa), on examination of the charts (researcher OFM), enough care was exercised to carefully separate and exclude CoHa patients from those presenting TTHa. The Beck Depression Inventory (BDI) is a robust psychological instrument having 21 self-rating items which measures depression. Each scale in the instrument has phrases ordered by the level of severity (0-3), and the patient is instructed to identify and record the

one that more accurately describes his/her feelings. The Cook-Medley Inventory (HO) is composed of sets of true or false questions (A or B) that the patient is instructed to select according to the one that better describes his/her reaction to a descriptive situation. Such questionnaire measures ability to get along well and to establish rapport with others, and represents the individual's own description. Reading patients' responses may provide a better insight into the personality of the individual. The hostile person is one who has little confidence in his/her fellows. Hostility is related to chronic hate or anger. Values in hostility in the Cook-Medley Inventory range from 0 (no hostility at all), to 46 (the highest severity of hostility). The Visual Analogue Scale (VAS) ranging from 0 (no pain at all) to 10 (the worst pain ever felt) was used to assess the severity of tension type headache and it allows any examiner to establish correlations between TTHa and bruxism, severity of pain and bruxism, and severity of pain in TTHa and chronicity of the chief complaint. Because this study was based on data from retrospective patients' charts (2003-2009) belonging to UNIRG Department of Orofacial Pain and Craniomandibular Disorders and offered no risk for the patient it was approved by the Ethics Committee of UNIRG Dental School.

Statistical analysis used in the current investigation included basic statistics (mean, standard deviation and range), non parametric ANOVA (Kruskall-Wallis and post hoc test: Dunn), and Correlation analysis (Pearson and Spearman).

#### 4. Results

**Table I: Demographic data in patients presenting TTHa+CMDs (N=100, CMDs+Facial Pain (N=38) and no CMDs-No Facial Pain (N=23)**

	CMD+TTHa		CMDs+Facial Pain		No CMDs-No Pain	
	N:100		N:38		N:23	
	n	%	n	%	n	%
Females	92	92	32	84	14	60.8
Males	8	8	6	16	9	39.2
Totals	100	100	38	100	23	100
Mean age	33.9		29.6		30.6	
SD	11.7		10.3		10.6	
Range	14---75		19---57		13--57	

**Table II: Means in hostility in the CMD+TTHa, CMD+Facial pain and Non- CMD No Pain Controls.**

	CMD+TTHa	CMDs+Facial Pain	No CMDs-No Pain
	N=100	N=38	N=23
Mean	19.0	17.7	17.2*
SD	5.1	6.3	6.1
Range	0---32	7-31	5---29

\*Kruskal-Wallis test  $p>0.33$ : A statistically non significant difference.

The level of hostility is higher in the CMD+TTH but not different stat speaking as in the CMD+TTHa group, hostility be-

comes depression. This is supported by data on depression. The level of depression in the CMD+TTHA is much higher.

**Table III: Depression in the CMD+TTHa, CMD+Facial Pain and No CMD-No pain subgroups.**

	CMD+TTHa	CMD+Facial Pain	No CMD/No Pain
	N=100	N=38	N=23
Mean	12	9.1	5.7*
SD	7.8	7.1	4.2
Range	0---3	0--24	0--13

\*Kruskal-Wallis test  $p<0.0009$  considered an extremely significant difference.

The difference in depression scores between the CMDs+TTHa and the CMDs+Facial Pain group was not significant ( $p>0.05$ ). The difference in the same scores was statistically significant between the TTHa group and the Non

CMD Non pain Control ( $p<0.01$ ). The difference in depression scores between the CMDs+Facial Pain and the Non CMDs No Pain, was not statistically significant ( $p>0.05$ ).

**Table IV: Means in bruxism in the CMDs+TTHa, CMD+Facial Pain and in the no CMD-No pain subgroups.**

	<b>CMDs+TTHa</b>	<b>CMD+Facial Pain</b>	<b>No CMD/No Pain</b>
	N:100	N=38	N=23
Mean	12.9	8.2	6.8***
SD	4.9	.0	4.4
Range	0---21	0---16	0---16

\*\*\* Kruskal-Wallis tests  $p < 0.0001$  considered an extremely significant difference: Mean difference between the CMDs/TTHa and the CMDs/Facial pain group ( $p < 0.001$ ), between the CMDs/TTHa group and NO CMD/No Pain group ( $p < 0.001$ ) and between the CMDs/Facial pain and the No CMDs/No pain control groups ( $p > 0.05$ ).

**Note:** Because bruxism scores are higher in the CMD+TTHa, hostility becomes dissipated, then CMD+TTH individuals do not have to become so hostile and then they are less depressed. Nevertheless, their level of depression is the highest in the three groups. If hostility were not dissipated through bruxism, they would become more hostile and depressed.

**Table V: Pearson correlation analysis in the groups CMDs+TTHa, CMDs+Facial Pain and Non CMD-No pain Controls.**

	<b>CMDs+TTH</b>	<b>CMDs+Facial</b>	<b>Pain No CMDs- No Pain</b>
	N:100*	N:38**	N:23***
Bruxism	12.9	8.2	6.8
Depression	12.0	9.1	5.7

\*Correlation analysis between bruxism and depression in the CMDs/TTHa. Because Pearson  $r = 0.4$  and  $p < 0.0001$ , it means that higher scores in bruxism correspond to higher scores in depression in the CMD+TTH group. The correlation was strong.

\*\*Correlation analysis bruxism and depression in the CMDs+Facial pain group. Because Pearson  $r = 0.24$  and  $p > 0.15$ , there was no a positive correlation between scores in bruxism and scores in depression in this subgroup of subjects.

\*\*\*Correlation analysis bruxism and depression in the Non CMD-Non Pain group. Because Pearson  $r = 0.48$  and  $p < 0.02$ , there was a positive correlation between bruxism and depression in this subgroup.

Table 1 shows that the mean ages in the group of CMD+TTHa, CMDs+Facial Pain and Non CMD Non facial individuals were about 33.9, 29.6 and 30.6 years respectively. Table II demonstrates that mean scores in hostility in the CMD+TTHa, CMDs+Facial Pain and Non CMDs No pain were about 19.0, 17.7 and 17.2, respectively. Non parametric ANOVA analysis (Kruskal-Wallis test  $p = 0.33$ ) demonstrated that such scores were not statistically different. Table III shows that mean scores in depression in the groups presenting CMDs+TTHa, CMDs+Facial Pain and no CMDs No Facial pain were about 12.0, 9.1 and 5.7 respectively. Such values were statistically different and significant (Kruskal-Wallis test  $p = 0.0009$ ). Table IV demonstrates that mean values in bruxism in the CMDs+TTHa, CMDs+Facial Pain and

Non CMDs No pain groups were about 12.9, 8.2 and 6.8, respectively. The difference from the CMDs+TTHa to the CMDs+Facial pain group was statistically significant (Kruskal-Wallis ANOVA  $p < 0.001$ ). Such difference was also significant from the CMDs+TTHa to the Non CMDs No Pain group (Kruskal-Wallis ANOVA  $p < 0.001$ ).

The difference in the severity of bruxism between the CMDs+Facial pain and the Non CMDs No pain was not statistically significant (ANOVA Kruskal-Wallis  $p > 0.05$ ).

Table V was used to show scores in correlation between bruxism and depression in the three aforementioned groups. Because the correlation value comparing bruxism-depression in the CMDs+TTHa group was about 0.4 and  $p < 0.0001$  as compared to the CMDs+Facial pain ( $r = 0.24$ ,  $p > 0.15$ )

and to the Non CMDs No pain ( $r=0.48$  and  $p<0.002$ ) such value indicates that there is a stronger correlation between bruxism and depression in the CMDs+TTHa group. On speculative grounds we may say that bruxism indicating suppressed hostility which leads to depression is an important element in the pathophysiological process of tension type headache. It may be that a third factor, for example somatization, is an important element common to bruxism, tension type headache and depression. Such assumption will be tested in a future study.

## 5. Discussion

### 5.1 Severity of hostility

One of the aims of this study is to assess hostility level in the TTH group as compared to the CMD+Facial Pain and to the Non-CMD no Pain group. The results of this study showed that there was not statistically significant difference in the level of hostility between the three groups (Kruskal-Wallis  $p>0.33$ ). Such outcome is unexpected as many studies emphasize the role of anger as a psychophysiological component in headache and CMD patients. It may be that most TTHa and CMD patients do present a type of anger which is displaced inward and is disguised as depression as such patients are unable to express such affect externally. Following this line of reasoning, it is noteworthy to mention that most CMD patients present with sign and symptoms of headache and one study (3) defend the notion that bruxism may build up because of the inability of the patient to express rage or hate. This line of reasoning is also supported by one investigation (16) evaluating the relationship between anger and psychophysiological disorders in TTHa individuals and no pain controls which reported that TTHa sufferers were found to have significantly more anger held inward than controls. Additionally, patients presenting chronic tension-type headache usually have physical and emotional dependency, low frustration tolerance, sleep disturbances and depression (2).

Additional support for the notion that CMDs and TTHa patients present with higher levels of anger held inward which becomes

depression, comes from one correlation study (17) about anxiety, depression and hostility demonstrating that internalized anger predicts depressive symptoms. Individuals with headache are more likely to hold their anger in as compared to persons without headaches (18,19)). Individuals who hold anger in, experience increased pain severity (20), and failure to express anger leads to more disability. One study in headache patients (21) reported that patients with migraine and TTH showed a significantly higher level of angry temperament and angry reactions. The research also indicated that chronic TTHa and combination headache patients reported a high level of depression and that chronic TTHa present a significant impairment of anger control suggesting a connection between anger and the duration of headache experience.

Battistutta and colleagues (22) evaluated adolescents presenting with TTHa and reported that the clinical group of adolescents obtained higher scores than the control group in aggressive behavior and greater emotional and behavioral problems when compared with non headache controls. Because we found similar hostility scores in different groups (TTH, Facial pain and controls) but different scores in bruxing behavior and depression, the results of the current investigation are substantiated by another study in 720 college men and women (23), reporting that college men and women did not differ in trait anger, anger-in or anger out, but there was a gender difference only in the way anger was expressed somatically. This line of evidence has additional support in the observation of higher scores in bruxism in TTHa individuals as compared to the facial pain and control no pain groups. Bruxing behavior is a somatic expression of hostility. Venable and colleagues (24) evaluated tension-type headache patients and reported a significant relationship between anger suppression and depression ( $r=0.40$ ).

### 5.2 Severity of depression

Because pain, hostility, bruxing behavior and TTHa are interrelated a second aim of this study was to assess the level of depression in TTHa individuals and controls. In this study we report that the level of depression

increased from the Non CMD/No Pain to the CMD+Facial Pain and to the TTHa group, but the difference was statistically significant only from the TTHa to the Non CMD no Pain group ( $P=0.0009$ ). The TTHa group also demonstrated a greater chronicity of the pain complaint. Thus, the results of this study are in accordance with one investigation (2) reporting that patients presenting chronic tension-type headache usually have physical and emotional dependency, low frustration tolerance, sleep disturbances and depression. Because more severe bruxism was observed in patients presenting TTHa as compared to the control groups, the results of this study are further substantiated by one investigation (25), which evaluated bruxers and non-bruxers and reported that the level of depression reflected by the BDI increased progressively from the mild to the moderate and severe bruxing behavior groups and the difference was statistically significant when compared to the control group.

Additionally, Ware and Rugh (26) evaluated a destructive or severe group of bruxers, and even though the sample was small, they found that patients in that group were more depressed and presented more severe CMD symptoms. In the current investigation we observed that a variety of depression levels were present in the population of CMD and Tension-Type Headache. Mild, moderate and severe levels of depression could be observed. Therefore, the results of our study are in accordance with those of Holroyd and associates (27) who reported a mean BDI score of 15.6, but 20% of the patients presented with a mean BDI of about 19 or more. They also reported a mean BDI score of 15.6 as compared to 12 in our population of Tension Type Headache patients. However such researchers assessed only chronic pain patients which could explain the higher BDI mean reported in their investigation. Because we found higher BDI scores in the population of TTHa patients as compared to the control groups, the results of our investigation are reinforced by one research (28) reporting that the average scores for anxiety and depression were significantly higher in headache sufferers as compared to controls. CMD and bruxing behavior patients and controls usually present similar levels of hostility. However, the level

of depression is usually higher in CMD and bruxing behavior individuals (25).

Data from this and other studies suggest that as pain and hostility becomes more severe depression as an expression of hostility becomes a more feasible indicator of such disorders.

### 5.3 Severity of bruxing behavior

Another goal of this study was to assess the severity of bruxing behavior in the TTHa group and to evaluate correlations between bruxism and hostility, and between bruxism and depression. In this study we report means of bruxing behavior of about 12.9, 8.2, and 6.8 in the groups presenting TTHa, CMDs+Facial Pain and No CMDs No Pain. It seems apparent that severer bruxism is found in patients presenting with tension type headache and CMDs. Because severer bruxism was more common in TTHa patients and bruxism is considered a psychosomatic disorder characterized by hyperactivity of the masticatory and adjacent musculature, TTHa patients are more likely to present pain of muscle origin, trigger points in the neck muscles and hyperactivity of masticatory and pericranial muscles. Supporting this line of evidence, one investigation (29) points out the importance of sustained contraction of neck and scalp muscles, abnormal sleep physiology and parafunctional habits in patients presenting with TTHa.

Ribeiro and associates (30) defend the notion that many patients presenting with TTHa exhibit some psychological disorders and increased contraction of the neck, pericranial and jaw muscles. It may be that some psychophysiological disorder, for instance, anxiety and/or somatization is a common phenomena for both, TTHa and bruxing behavior. This point of view is reinforced by the fact severer bruxism was found more frequently among tension-type headache patients.

### 5.4 Correlation analysis: Bruxism and depression

Previously, we defended the notion that depression and or severer bruxism as a form of suppressed hostility would be a better indicator of hostility. This point of view has support in one



study (25) evaluating bruxers and nonbruxers and reporting that the severity of hostility was not so different between CMDs patients/Bruxers and controls. However, the level of depression reflected by the BDI increased progressively from the mild to the moderate and severe bruxing behavior groups and the difference was statistically significant when compared to the control group. Additionally, one investigation (26) evaluated a destructive or severe group of bruxers, and even though the sample was small they found that patients in that group were more depressed and presented more severe CMD symptoms. Interesting to note is that only the moderate group of bruxers demonstrated a significantly more severe hostility as compared to the control group. It may be that as the severity of bruxing behavior increases (more hostility inwards), there is a point where such hostility is internalized. It follows that as the severity of bruxing behavior increases from moderate to severe and extreme the level of depression as an expression of hostility inward increases. If this line of reasoning is true, then higher levels of depression should be found in severe and extreme forms of bruxing behavior.

Data from this and other studies suggest that as pain and hostility becomes more severe, depression as an expression of hostility, becomes a more feasible indicator of such phenomenon. Because bruxing behavior was more severe in TTHa patients, and sustained muscle hyperactivity can affect the masticatory, pericranial and cervical muscles, the results of this investigation are supported by one study (4) reporting that the best documented abnormality in TTHa patients is the presence of pericranial and cervical tenderness. Hostility inwards in the form of bruxing behavior which leads to increased levels of depression is a strong component in patients presenting with CMD /tension type headache and CMD/Facial pains. This observation has strong support in the correlation analysis between bruxism and depression: CMD+TTHa group ( $r=0.4$ ,  $p=0.0001$ ), CMD and Facial Pain ( $r=0.24$  and  $p=0.15$ ) and Control Non Pain group ( $r=0.48$ ,  $p=0.02$ ).

## 6. References

1. Millea, P.; Brodie, J.J. Tension- type headache. **American Family Physicians**, v.66, p. 804-805, 2002.
2. Silberstein, S. D. Tension-type headaches. **Headache: The Journal of Head and Face Pain**, v.34, p.S2-S7, 2005.
3. Campbell, D. G. **Psychosomatic mechanisms in s oral disease**. American Journal of Orthodontics and Oral Surgery, v. 31, p. 440, 1945.
4. Kim H.S.; Chung S.C.; Kim, Y.K.; Lee, S.W. **Pain-pressure thresholds in the head and neck region of episodic tension-type headache patients**. Journal of Orofacial Pain, v.9, p.357-364, 1995.
5. American College of Physicians Internet 2009, p.1-2.
6. Burns, J.W.; Bruehl, S.; Quartana, P. **Anger management style and hostility among patients with chronic pain**. Psychosomatic Medicine, v.68, p.786-793, 2006.
7. Engel G. **Psychogenic pain and the pain prone patient**. American Journal of Medicine, v.26, p.899-918, 1959.
8. Sjegaard, G.; Lundberg, U.; Kudelfors, R. **The role of muscle activity and mental load in the development of pain and degenerative processes f the muscle cell during computer work**. European Journal of Applied Physiology, v.83, p. 99-105, 2000.
9. Fields, H.L. **Pain. 1**. Ed. New York: Raven Press, 1987.
10. Finney, M.; Stoney, C.M.; Engebretson, T.O. **Hostility and anger expression in African American and European American me is associated with cardiovascular and lipid reactivity**. Psychophysiology, v.39, p.340-349, 2002;
11. Nicholson, R.A.; Houle, T.T.; Rhudy, J.; Norton, P. **Psychological risk factors in headache**. Headache, v. 47, p.413-426, 2007.
12. Molina, O.F.; dos Santos, J.; Nelson, S.; Grossman, E. **Prevalence of modalities of headache and bruxism among patients with cranimandibular disorders**. Journal of Craniomandibular Practice, v. 15, p.314-325, 1997.

13. Molina, O.F.; Peixoto, M.G.; Santos, Z.C.; Penoni, J.D.; Aquilino, R.N.; Sobreiro, M.A. **Bruxism as a mechanism subserving hysteria: A new theory.** Revista Neurociencias, v.16, p.262-268, 2008.
14. Ad Hoc Committee on Classification of Headaches. **Classification of Headache.** Journal of American Medical Association, v.179, p.717-718, 1962.
15. American Headache Society WWW. AmericanHeadacheSociety.org
16. Arena, J.G.; Bruno, G.M.; Rozantine, G.S.; Meador, K.J. **A comparison of tension headache sufferers and nonpain controls on the state-trait anger expression inventory.** Applied Psychophysiology and Biofeedback, v.22, p.209-214, 1997.
17. Bridewell, W.B.; Chang, E.C. **Distinguishing between anxiety, depression and hostility: Relationships in anger in, anger out and anger control.** Personality and Individual Differences, v.22, p. 587-590, 1997.
18. Materazzo, F.; Cathcart, S.; Pritchard, D. **Anger, depression and coping interactions in headache activity and adjustment. A controlled study.** Journal of Psychosomatic Research, v.49, p.69-75, 2000.
19. Hatch, J.P.; Schoenfeld, L.S.; Boutros, N.N.; Seleshi, E.; Moorte, P.J.; Cyr-Provost, M. **Anger and hostility in tension-type headache.** Headache, v. 31, p. 302-304, 1991.
20. Wade, J.B.; Price, D.; Hammer, R.M.; Schwartz, S. M.; Hart, R.P. **An emotional component analysis of chronic pain.** Pain, v. 40, p.303-310, 1990.
21. Perozzo, P.; Savi, L.; Castelli, L.; Valfré, W.; Lo Giudice, R.; Gentile, S.; Raineiro, I.; Pinessi, L. **Anger and emotional distress in patients with migraine and tension type headache.** The Journal of Headache and Pain, v.6, p.392-399, 2005.
22. Battistuta, S.; Aliverti, R.; Montic, M.; Zin, M.; Carrozzi, M. **Chronic tension-type headache in adolescents.** Clinical and psychological characteristics analyzed through self- and parent-report questionnaires. J Pediatric Psychology, v.34, p.697-706, 2009.
23. Thomas, S.; Williams, R.L. **Perceived stress, trait anger, modes of anger expression, and health status of college men and women.** Nursing Research v.40, p.303-307, 1991
24. Venable, V.; Carlsson, C.R.; Wilson, J. **The role of anger and depression in recurrent headaches.** Headache, v. 41, p. 21-30, 2001.
25. Molina, O.F.; dos Santos, J. **Hostility in TMD/bruxing patients and controls: A clinical comparison study and preliminary results.** Journal of Craniomandibular Practice, v.20, p. 282-288, 2002.
26. Ware, J.C.; Rugh, J.D. **Destructive bruxism: Sleep stage relationships.** Sleep, v. 11, p. 172-181, 1988.
27. Holroyd, K.A.; Stensland, M.; Lipchik, G.L.; Hills, K.R.; O'Donnell, F.S.; Cordingley, G. **Psychosocial correlates and impact of chronic tension-type headache.** Headache, v. 40, p. 3-16, 2000.
28. Mitsikostas, D.D.; Thomas, A.M. **Comorbidity of headache and depressive disorders.** Cephalalgia, v. 19, p. 211-217, 1999.
29. Kreisberg, M.K. **Headache as a symptom of craniomandibular disorders I: Pathophysiology.** Journal of Craniomandibular Practice, v.4, p.134-141, 1986. 1986;
30. Ribeiro, C.A.; Esperança, P.; Souza, L. **Cefaléias tipo tensão: fisiopatologia, clínica e tratamento.** Revista Portuguesa de Clínica Geral, v.22, p. 483-490, 2006.

---

**Endereço para Correspondência:**

Omar Franklin Molina  
 ofrank.nyork.harvard.texas@hotmail.com  
 Avenida Pará, 1544  
 Gurupi - TO  
 CEP: 77400-020

**Informações bibliográficas:**

Conforme a NBR 6023:2002 da Associação Brasileira de Normas Técnicas (ABNT), este texto científico publicado em periódico eletrônico deve ser citado da seguinte forma: MOLINA, Omar Franklin; PEIXOTO, Marcus Sobreira; AQUILINO, Raphael Navarro; RANK, Rise. The modulating effect of bruxism as a form of suppressed hostility on depression in a selected population of tension type headache (tth) and craniomandibular disorders (cmds) individuals. **Cadernos UniFOA**. Volta Redonda, Ano VI, n. 15, abril 2011. Disponível em: <http://www.unifoa.edu.br/cadernos/edicao/15/91.pdf>