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Temporomandibular Disorder in Brazilian Patients: A Preliminary Study

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Abstract The objective of the current study was to evaluate disease-related beliefs, adherence to treatment, quality of life, coping strategies and cognitive status in a group of Brazilian patients with Temporomandibular Disorder (TMD). Thirty patients were evaluated with a semi-directed interview, the Coping Strategies Inventory, and a Mini-Mental State Examination. Although half (50%) of the patients had known their diagnosis long term, 40% of the sample were not correctly following proposed treatment. All patients had a similar pattern of pain behavior related to TMD, while disease-related beliefs, quality of life and coping strategies were variable. Expectations about treatment also had significant association with treatment adherence. The findings of this study suggest that a more thorough understanding of individual differences in TMD is warranted.

Keywords Orofacial pain · TMD · Coping · Psychology · Cognition · Behavior · Chronic pain

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Introduction

Pain is "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage" (International Association for the Study of Pain (IASP), 1994). Pain, especially when chronic, is believed to be modulated by psychological factors (which include emotional, cognitive and behavioral aspects), and the patient's perception of the disease may often be larger than the injury itself (Lobato, 1992; Litt, Shafer, & Napolitano, 2004; Gatchel, Stowell, Wildenstein, Riggs, & Ellis, 2006; Niemi, Le Bell, Kylmälä, Jämsä, & Alanen, 2006). Additionally, chronic pain is one of the main causes of physical and psychosocial distress, absences at work and retirement because of handicap (Carlsson, 2008). Thus, to adequately treat pain it is necessary to understand and assess its psychologically associated factors (Riehcelmann, 2001; Jerjes et al., 2007).

Pain at the facial area is very common. It is complex because of the singularities of the trigeminal nervous system, which often leads to spread and diffuse pain (Sessle, 2000). The orofacial region has a vast innervation and a wide representation at the sensorial cortex (Cailliet, 1999). The most common head and facial pains in the Brazilian population are: tension type headache (60.2%), migraine (48.6%), and toothache (38.4%) (Teixeira, 1994). Among all subtypes of orofacial pain, dental-alveolar pain and Temporomandibular Disorders (TMD) are the most prevalent (Okeson, 1998). TMD is characterized by functional abnormalities and/or musculo-skeletal pain at the masticatory muscles. Pain can be continuous or occasional and brief during mastication, and it is frequently associated with jaw restricted movements and joint sounds (IASP, 1994). It is present in 16–59% of the population (Carlsson & DeBoever, 2000). Etiological factors of TMD are undefined and include anatomical, articular, neuromuscular and psychological factors (DeBoever & Carlsson, 2000; Turp et al., 2007).

Psychological aspects, coping and catastrophizing differ among orofacial pains. TMD is considered easily handled by patients when compared to neurovascular headaches, e.g. tension headaches that have similar symptoms and signs (Jerjes et al., 2007). Levels of anxiety, depression, and illness behavior change during time, depending on external factors (e.g. family, job) and the course of the disease (e.g. pain intensity, crises) (Litt et al., 2004; Turner, Mancl, & Aaron, 2005; Jerjes et al., 2007). There are many studies about the psychological aspects of TMD, and in general they are similar to other chronic pain syndromes in many samples around the world (Schnurr, Brooke, & Rollman, 1990; Aaron et al. 2006; Turner, Holtzman, & Mancl, 2007). To expand on this body of literature, the objective of this study was to evaluate disease-related beliefs, adherence to treatment, quality of live, coping strategies and cognitive status in a group of Brazilian patients with TMD.

Methods

Participants in the current study were 30 orofacial pain patients that were receiving treatment at the Orofacial Pain Team of Hospital das Clínicas, Medical School of the University of Sao Paulo, Brazil. Patients fulfilled the IASP criteria for TMD (IASP, 1994), and were evaluated by one psychologist. All participants had myofascial pain without mouth opening limitation and without Temporomandibular Joint (TMJ) sounds.

Treatments that participants were receiving for TMD were splints and physical therapy. All patients used in this study were voluntary participants, older than 18 years of age and had conditions to understand the protocol. All of them were assessed in a psychiatric interview before the study. All participants signed informed consent forms and the study was approved by the Ethics Committee of the hospital. Patients with psychiatric diagnoses (e.g. schizophrenia, bipolar disorder and any other neuropsychiatric diagnoses) or patients with a secondary medical diagnosis (e.g. cardiac disease, diabetes mellitus) were excluded from this study.

Participants

Thirty randomized patients participated in this study. Twenty-eight (93.0%) patients were female, and ages ranged from 23 to 61, with a mean age of 44.6 years old (SD = 12 years old; highest prevalence (16.7%) of patients was at the 50th decade of life). Please refer to Table 1 for more details regarding the demographic characteristics of the sample.

The gender proportion corresponded to what is expected for TMD patients in the Brazilian population (Teixeira, 1994). There was great variation in the general characteristics of the participants which corresponds with data from other TMD samples, including the Brazilian population (Camparis et al., 2006).

Instruments

The interviews had a mean duration of 50 min. For the evaluation, the following instruments were utilized and were administered in the same order. This sequence was used in order to standardize the evaluations of all patients, starting with the aspects of the disease.

1. The semi-directed interview included queries about the characteristics of the disease (duration, diagnosis), social-demographic data (gender, age, occupation, educational level, marital status, religion), adherence to treatment and perception of the disease (individuals

Table 1 Demographic characteristics of the sample (*N* = 30)

Gender	28 (93.0%) female	2 (7.0%) male
Age	Range from 23 to 61 years	
	Mean of 44.6 years (SD = 12 years)	
Marital status	Married: 17 (57%)	Widowed: 3 (10%)
	Single: 8 (26.7%)	Divorced: 2 (6.7%)
Educational level	Never went to school: 12 (40%)	High school: 10 (33.3%)
	Basic education: 3 (10%)	Graduate (Incomplete): 1 (3.3%)
	Incomplete high school: 2 (6.7%)	Graduate: 2 (6.7%)
Religion	Catholic: 16 (53.3%)	Other or no religion: 4 (13.3%)
	Protestant: 10 (33.3%)	
Job	Housewives: 10 (33.3%)	Retired: 4 (13.3%)
	Maid: 4 (13.3%)	Unemployed: 3 (10%)
	Seller: 4 (13.3%)	Did not answer: 3 (10%)

interested in reviewing the entire details about the semi-directed interview can obtain this information from the first author);

2. The Mini-Mental State Examination (MMSE; Folstein, Folstein, & McHugh, 1975), adapted by Bertolucci, Bruch, Campacci and Juliano (1994) and validated to the Portuguese language (Maia et al., 2006); was used for the evaluation of cognition, which is often affected by chronic pain (Seminowicz & Davis 2007);
3. The Cognitive Coping Strategies Inventory (CCSI; Butler, Damarin, Beaulieu, Schwebel, & Thorn, 1989), which consists of the subscales of Confront, Dismissal, Self-control, Social support, Acceptance of responsibility, Escape and dodge, Problem-solving and Positive reevaluation, translated and validated for the Portuguese language (Savoia, 1999) was administered next. The CCSI consists of 32 multiple choice questions divided into three sections: distraction, catastrophizing and coping self-statement. The questions for the negative coping strategies are reverse scored to get the final score.

Analysis

Data were collected and evaluated considering frequencies and correlations. Statistical analysis was performed with the Fisher Exact Test and the chi-square test. Data were also qualitatively analyzed.

Results

All patients had TMD with myofascial pain without mouth opening limitation or noted abnormalities at the TMJ. Participants had no other orofacial, psychiatric or medical diagnoses and were not receiving any pharmacological treatment. Mean pain duration was 6.6 years (range 0.5–24 years, SD = 5.9 years, Mdn: 4 years). The duration of the treatment at the Orofacial Pain Clinic ranged from 0.5 to 18 years (mean 3.1 years, SD = 4.5 years, Mdn: 1.2 years).

Cognitive Evaluation (MMSE)

No patient presented cognitive impairment in this sample as measured by the MMSE (score ≤ 18). Mean score of this sample was 27.3 (SD = 2.5; range from 19 to 30).

Beliefs About Severity, Causality and Cure (Semi-Directed Interview)

Information regarding the patients' perception of the disease and the beliefs was obtained through clinical interview and the data were analyzed in association to the severity of TMD, possible causes and possible cure:

Complaints about severity of the disease were variable in this sample: 17 (56.7%) patients considered it mild or not severe and 14 (43.3%) patients considered it severe. Higher severity was present in patients with higher difficulties controlling symptoms ($p = .04$) and with close relationships to family and friends ($p < .05$) (Fisher's exact test). For the statistical analysis, we considered little or no severity × higher levels of severity, and the presence or absence of difficulties to control symptoms and closer relationships.

The majority of patients (11–36.7%) associated their pain to previous dental treatment. Other causes can be observed in Table 2.

Twenty-four patients (80%) believed that cure would happen some day, but it would take more than a year to occur (21 patients; 70.0%) noting that the dentist told them there would be a cure some day.

Adherence to Treatment (Semi-Directed Interview)

Adherence was measured by qualitative data from the semi-directed interview, and the variables considered were: assiduity at appointments and report by the patients about following the doctor's recommendations. Self-report suggested that 25 patients (83.3%) had a high degree of frequency at appointments, but when asked about the therapeutics suggested, forty percent of the patients indicated that they were not correctly following the recommendations made by their physician, and the reasons for their noncompliance are outlined in Table 3.

To further evaluate non-adherence we analyzed the adherence (yes or no) and the level of coping (above or below the mean value) by the Fisher's exact test, and found that higher adherence was associated with higher coping (CCSI) ($p < .001$).

Half of the patients reported that they needed more information about their disease than what was given by the

Table 2 Causality of pain symptoms ($N = 30$)

Attributed cause for pain	*N*	%
Previous dental treatments	11	36.7
No event associated	8	26.7
Affective reasons	4	13.3
Accidents	2	6.7
Other	2	6.7
Losses, death of relatives	1	3.3
Genetic factors	1	3.3
The patient believes a cause must exist but does not know what it is	1	3.3

Table 3 Reasons to treat/not treat the chronic orofacial pain ($N = 30$)

Patients' reported reasons	N	%
Cares about health; Sees recommendation as for personal good	14	46.7
Does not believe following recommendations will allieve symptoms	6	20.0
Laziness, discouragement, forgetfulness	5	13.3
Does the treatment to avoid feeling guilty in the future	2	6.7
Follows recommendations according to sensations of necessity	2	6.7
Other	1	3.3

physician; 5 (16.7%) patients had some information provided to them in all appointments, 1 (3.3%) sometimes, 1 (3.3%) rarely and 8 (26.7%) reported that they had not been given any details about TMD. Among the patients who reported receiving rare or no disease-related information, only 4 (40%) patients reported that it was enough (i.e. felt they knew what they needed to know about their disease and did not need further education from their physician).

Regarding treatment, 19 patients (63.3%) reported that they had always received treatment related information, 2 (6.7%) almost always, 3 (10%) sometimes and 6 (20%) never. Twenty-one patients (60%) felt that the treatment related information they had received was sufficient, with 7 patients specifically indicating that treatment was improving their pain.

Treatment strategies were reported as: 22 (73.4%) were using splints, 19 (60%) were receiving physical therapy and 7 (20%) were having anti-inflammatory drugs for eventual use (not prescribed by the dentist, used by their own). Some patients (7) were having all three therapies. Twenty patients reported no difficulties following through with treatments, although 10 of them (33.3%) were not satisfied with the treatment: 4 (40.0%) were unsatisfied with the application of heat to the face, 2 (20.0%) with the splints and 2 (20.0%) with the drugs. Reasons given by the participants for their dissatisfaction included difficulties changing habits, discomfort and collateral effects of the medicine.

Quality of Life and Coping

The majority of patients (21; 70%) reported that they received family cooperation regarding their treatment; 4 (13.3%) reported frequent family cooperation, 4 (13.3%) reported eventually receiving it (less than once a semester) and 1 (3.3%) reported no cooperation. Quality of life (affective, familial and professional domains) is outlined in Table 4. Coping strategies used to deal with TMD (as measured by the Coping Strategies Inventory) can be found in Table 5. The mean score was 27.3 (SD = 2.5, Mdn: 28), with range from 19 to 30. The maximum score is 66, and coping with the disease is considered better if the score is higher.

Discussion

The current sample displayed a variety of perceptions about TMD in relation to severity level, beliefs about cure, causality, adherence and variable ways of coping. As a chronic pain syndrome, TMD, is unique for each person and has a wide range of expressions and interpretations (IASP, 1994). These findings are consistent with other studies that have shown that many psychological factors (personality type, response to illness, attitudes towards health care, coping with stress) are present in TMD or other chronic pains, therefore a variety of causes may be present, and the challenge is to determine occasions when pain is underlying it (Schnurr et al., 1990; Turner et al., 2007).

Fortunately, although TMD pain is viewed as chronic, within our sample patients still believed in cure and in possible causes that were not yet identified by the doctors

Table 4 Quality of life of patients ($N = 30$)

	Affective life		Familial relationships		Professional life	
	n	%	*n*	%	*n*	%
Good	16	53.3	21	70.0	6	20.0
Regular	11	36.7	7	23.3	3	10.0
Bad	2	6.7	1	3.3	5	16.7
Does not know	1	3.3	1	3.3	–	–
Does not work	–	–	–	–	16	53.3

Table 5 Cognitive Coping Strategies Inventory; maximum score of 66 ($N = 30$)

Coping strategies	Mean	Standard deviation	Minimum	Maximum
Confront	6.4	3.7	0	17
Dismissal	6.6	3.8	0	16
Self-control	8.2	2.4	3	12
Social support	10.0	4.0	3	18
Responsibility acceptance	10.1	3.4	4	17
Escape and dodge	3.4	2.0	0	6
Problem-solving	7.9	2.3	4	12
Positive reevaluation	15.3	4.5	7	24

(Aaron et al., 2006; Amaral, 2001). Because of the variety of pain coping strategies utilized treatment adherence may also vary. In this study, the higher adherence was associated with higher scores of coping.

General characteristics of our patients were similar to other TMD international samples (e.g. gender, ages, job; Carlsson & DeBoever, 2000). It is interesting that the majority of patients reported a longer duration of pain (6.6 ± 5.9 years) than the duration of the treatment (3.1 ± 4.5 years). This finding could suggest patients waited to begin treatment after the onset of pain (Marin, 1995), but it is important to also consider that this delay in receiving treatment may have been due to the delay of the diagnosis (Siqueira, Nobrega, Valle, Teixeira, & Siqueira, 2004). Chronic pain has symptoms and signs that fit with many different possible diagnoses and ineffective treatments are common in patients' history of the disease (Siqueira et al., 2004). Subsequently, it is also possible that misdiagnosis and failure of previous treatments would reduce coping and adherence, but future research is necessary to verify if this is true. Pain is not uniform over time and likely becomes more uncomfortable with duration and is accompanied by impairment in the quality of life (Amaral, 2001) as time progresses. We could observe in our sample that familial relationships were especially affected (Table 4).

The clinician should make sure the patient has information about the TMD diagnosis and treatments (Valle, Viegas, Castro, & Toledo, 2000). Many patients in this sample complained about not knowing what they had or why the proposed treatment had been offered which may be due in part to the fact that it is a challenge for the clinician to explain a multifactorial disease such as TMD (Valle et al., 2000), which has no etiological clear evidence, and compromises coping (Trentini & Silva 1992; Litt et al., 2004). Also adherence is affected by the difficulties a patient may have about understanding pain, associated factors and also treatment's reasons.

Psychological factors vary with the duration of TMD (Jerjes et al., 2007), but in general they include impact in quality of life, emotional impairment, and illness behavior (Turner et al., 2005; Aaron et al., 2006). Coping strategies in our sample were different from other studies (Schnurr et al., 1990), probably because of cultural aspects, and included less Self-control and less Escape or dodge, and higher Social support, Responsibility acceptance and Positive reevaluation. It is important to remember that the environment influences pain perception and coping, and should be assessed along with TMD treatment (Schnurr et al., 1990).

It is important to note that we did not find lowered cognitive scores in our sample although other authors have suggested cognition may be affected in this sample (Seminowicz & Davis, 2007). Other important limitations of this study were the small sample size and the fragility of some variables obtained by self-report (e.g. measure of adherence). As a preliminary study, our findings indicate that some important issues regarding TMD and coping should be explored in future researches.

We found a great variability in the perception of pain by TMD patients, quality of life and ways of coping with it. This variety must be understood to insure patients' success. Patient expectations about treatment had a significant relationship with their adherence to the treatment. However, it is important to remember that this is a small sample, and a limited preliminary study, but its results indicate that this issue should be better explored in future studies.

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