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Temporomandibular Joint Pain: Diagnostic Characteristics of Chronicity

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The purpose of this study was to identify pain characteristics in relation to time that might be serving as a diagnostic aid in differentiation of the acute stage from the chronic. Twenty-four patients with signs and symptoms of TMJ dysfunction with or without pain of the associated muscular system participated in this study by filling in the sfMcGill pain questionnaire. The patients are divided into two groups. In the first group, patients were classified as having acute TMJ pain who reported TMJ pain of less than three months (n = 7). In the second group patients reported TMJ pain history of more than three months, classified as chronic group (n = 17). After statistical analysis, significant levels were found in the two groups, $p < 0.05$, rejecting the null hypothesis that the proportion of patients in the acute and chronic groups characterized the pain as sharp and tender is 0.5, respectively. The process chart and the differenced area in relation to time were not significant due to small number of time points. Although these two groups had significant characteristics, the small sample size of this study indicated the requirement for future research.

Key words: TMJ, acute, chronic, diagnostic characteristics

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INTRODUCTION

Pain is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage (IASP Subcommittee, 1979) and may be classified into short-term and long-term patterns (Tversky *et al.*, 1991).

TMJ pain is characterized as a unilateral or bilateral pain in the joint (s) and its associated craniofacial muscular system (Harris *et al.*, 1993) in addition to other symptoms such as tinnitus and popping (Feinmann and Harrison, 1997). Experience of pain is determined by sensory, affective and evaluative word descriptors (Melzack, 1975). The short-form of McGill questionnaire is a self reported tool composed of 15 pain words measuring pain in a multidimensional form. This form contains 2 sections; the first characterizes the pain with additional details on the experience of sensation and the second incorporates the Visual Analogue Scale (VAS) and the pain intensity measure (Cassisi *et al.*, 2004). The visual analogue scale is highly correlated with the short form of the questionnaire (Dudgeon *et al.*, 1993). This useful questionnaire may be used for differentiating psychiatric patients from those without psychiatric background (Lebovits, 2000).

An acute episode of pain generally has a sudden onset due to local tissue damage and resolves within 4 to 12 weeks (Cousins, 1994). Another recommendation for diagnosing acute TMJ pain is that the patients have never been previously diagnosed as having TMJ pain in the previous six months before the assessment (Marbach, 2001). Since there are no standardized diagnostic criteria for the condition of masticatory dysfunction (Catanzariti *et al.*, 2005), a need for appraisal of the differential diagnosis between acute and chronic pain of the stomatognathic system may be required in relation to time.

MATERIALS AND METHODS

This research achieved ethics approval by the Ethics Research Committee for clinical studies in humans (03/E013), in accordance with the Helsinki declaration and its amendments. An information sheet and a consent form were given to all subjects. The purpose of the study was notified to the participants orally and by reading the information sheet. The participation was limited to that specified in the information sheet. All of the subjects agreed to participate to fill in the questionnaire form by signing the consent form.

During this study, the short-form of McGill pain questionnaire was used. Additionally, a dental mirror and a metallic ruler were used for the clinical examination in the dental unit.

All of the patients (chronic = 17, acute = 7) were referred either by a general dental practitioner or a medical specialist. Inclusion criteria for patients selection related to signs and symptoms of TMJ dysfunction including pain in the joint area, with or without pain in the associated masticatory musculature, limited mouth opening and clicking. The exclusion criteria were pregnant or breast feeding women, ages outside the range of 16 to 55 years old and bone pathology, including fractures and arthritic changes.

For compliance with the Ionizing Radiation Regulations 2000 (IRMER), the number of dental panoramic tomography per patient was one, with the effective dose per procedure to be 0.0128 to 0.026 mSv (Lecomber *et al.*, 2000). Therefore, in order to reduce the exposure, the anterior dental arches were not imaged in accordance with this dose range.

For the data analysis the SPSS 12.0 statistical package was used.

RESULTS

The patients participating in the study (chronic = 17, acute = 7) filled in the short-form McGill pain questionnaire and examined clinically. Most of the patients were woman (n = 16) accounting for 66.7% of the total diseased population. The mean age for the women was 33.2 years, emphasizing occurrence in the period of the reproductive age. The men (n = 8) had mean age of 37.8 years. The analysis of the total population showed that the majority of the patients (87.5%) reported the pain as tender. On the other hand, the less common pain characterization of pain in the total population was the term splitting in 20.8%.

Analyzing the first section of the questionnaire, which is a measurement tool of the severity of various pain descriptors, significant correlations were found at the level of 0.01 and 0.05.

The arithmetical mean, the standard deviation and the standard error of mean of each of all pain characters in the first section of the questionnaire are shown in Table 1. The independent samples test of all pain characters are shown in Table 2. Performing, t-test for equality of means the characters sharp and tender found significant with $p < 0.05$ in both groups. By dividing the acute group according to the degree of sharpness into none, mild, moderate and severe, the mean was 2.29 when these were

Table 1: Statistical analysis of all pain characters

Pain characters	CHRONIC		ACUTE	
	Mean±SD	SEM	Mean±SD	SEM
Throbbing	1.41±1.064	0.258	1.00±1.155	0.436
Shooting	1.24±1.200	0.291	1.43±1.512	0.571
Stabbing	0.76±1.091	0.265	1.71±1.380	0.522
Sharp	0.88±1.269	0.308	2.29±0.756	0.286
Cramping	0.76±1.414	0.265	1.00±1.091	0.535
Gnawing	0.65±1.134	0.242	0.57±0.996	0.429
Burn	0.45±0.712	0.173	0.57±1.134	0.429
Aching	2.35±0.900	0.170	2.14±0.702	0.340
Heavy	1.06±1.144	0.277	1.14±1.464	0.553
Tender	2.00±0.866	0.210	0.86±0.690	0.261
Tiring	1.35±1.222	0.296	0.86±1.215	0.459
Sickening	0.59±0.870	0.211	0.57±1.134	0.429
Fearful	0.65±0.931	0.226	0.71±1.254	0.474
Punishing	0.35±0.606	0.147	0.71±1.113	0.421
Splitting	0.29±0.772	0.187	0.86±1.464	0.553

Table 2: The results from independent samples test. The findings indicated the significance of sharp and tender

Pain characters	t-value	p-value	Mean diff.	SED	95% CI	Diff.
Throbbing	-0.842	0.409	-0.412	0.489	-1.427	0.603
Shooting	-0.812	0.435	0.193	0.507	-1.535	0.711
Stabbing	0.333	0.742	0.193	0.581	-1.011	1.397
Sharp	0.301	0.770	1.403	0.641	-1.251	1.637
Cramping	1.796	0.086	0.950	0.529	-0.147	2.046
Gnawing	1.623	0.138	1.403	0.585	-0.368	2.267
Burn	2.713	0.013	0.160	0.517	0.330	2.476
Aching	3.342	0.004	-0.076	0.420	0.523	2.284
Heavy	0.441	0.664	-0.076	0.534	-0.871	1.342
Tender	0.394	0.702	0.160	0.596	-1.112	1.582
Tiring	-0.163	0.872	0.160	0.465	-1.040	0.889
Sickening	-0.154	0.881	0.160	0.492	-1.171	1.020
Fearful	0.419	0.679	0.160	0.381	-0.630	0.950
Punishing	0.346	0.739	0.160	0.462	-0.905	1.225
Splitting	-0.615	0.545	-0.210	0.342	-0.919	0.499
Throbbing	-0.552	0.594	-0.210	0.380	-1.068	0.648
Shooting	0.151	0.881	0.084	0.557	-1.070	1.238
Stabbing	0.136	0.895	0.084	0.619	-1.312	1.480
Sharp	-3.097	0.005	-1.143	0.369	-1.908	-0.377
Cramping	-3.413	0.004	-1.143	0.335	-1.861	-0.425
Gnawing	-0.905	0.375	-0.496	0.548	-1.632	0.640
Burn	-0.907	0.383	-0.496	0.547	-1.695	0.703
Aching	-0.039	0.969	-0.017	0.426	-0.901	0.867
Heavy	-0.035	0.973	-0.017	0.478	-1.096	1.063
Tender	0.145	0.886	0.067	0.462	-0.891	1.026
Tiring	0.128	0.901	0.067	0.525	-1.123	1.257
Sickening	1.034	0.312	0.361	0.349	-0.363	1.086
Fearful	0.811	0.442	0.361	0.446	-0.678	1.400
Punishing	1.243	0.227	0.563	0.453	-0.376	1.503
Splitting	0.964	0.365	0.563	0.584	-0.803	1.929

scored using a 0-3 scale, respectively. Similarly, using the data collected from the chronic group, the scoring system ranged from zero to three and the mean was calculated to be 2.

Using the Pearson Chi-squared asymptotic sig, $p = 0.007$, indicating there is evidence to reject the null hypothesis that the proportion of patients in the acute group characterized the pain as sharp is 0.5. The percentages in none and mild to severe were found to be 0 and 100%, respectively.

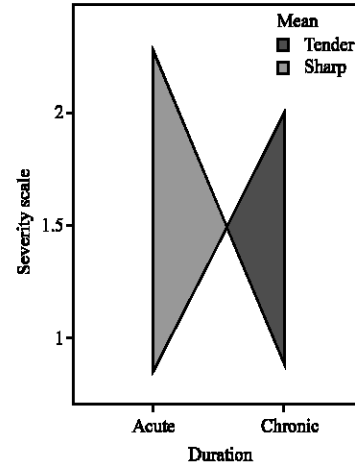


Fig. 1: The differenced area between acute and chronic group. Y-axis represented the severity scale (0 = none, 1 = mild, 2 = moderate, 3 = severe)

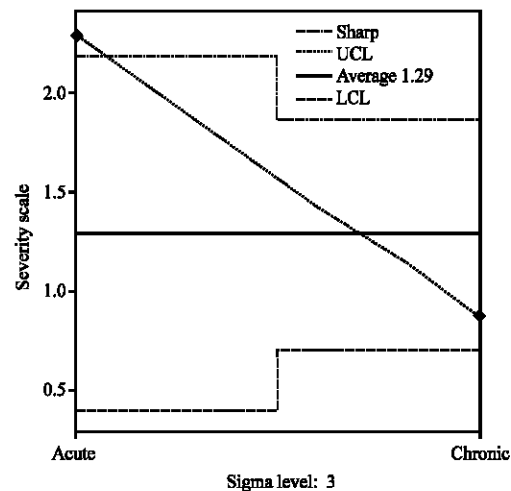


Fig. 2: The control chart for the mean of sharp. Y-axis represented the severity scale (0 = none, 1 = mild, 2 = moderate, 3 = severe)

In the chronic group, using Pearson's Chi-square, significance was established at the 0.043 level rejecting the null hypothesis that the proportion of patients in the chronic group characterized the pain as tender, is 0.5. The percentages in none and mild to severe were found to be 5.9 and 94.1%, respectively.

To estimate the differenced area, the means of sharp and tender characters in relation to duration were used (Fig. 1). To test the process of tender and sharpness in relation to time, the control chart was used (Fig. 2 and 3). This test is based on the mean values of the above groups' characteristics and variability.

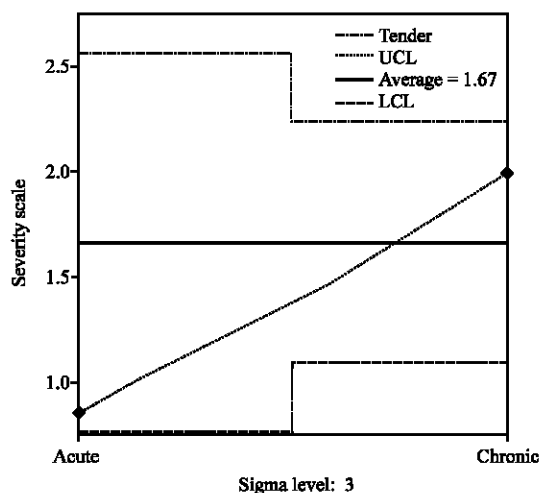


Fig. 3: The control chart for the mean of tender. Y-axis represented the severity scale (0 = none, 1 = mild, 2 = moderate, 3 = severe)

DISCUSSION

The McGill pain questionnaire is a widely used verbal method for differentiation between individuals with headache and those with facial pain (Mongini and Italiano, 2001). It was our interest to use the questionnaire for evaluation of time related characteristics of the TMJ pain. For the differentiation between the acute and chronic stage of the disease, the classification suggested by Cousins has been adopted (Cousins, 1994).

The findings of this study indicated that the patients who suffered acute TMJ pain, reported higher severity levels as a consequence of increased jaw disability where the chronic group reported lower severity. On the other hand, the chronic pain may be related to psychological factors making the assessment more complex (Suvinen *et al.*, 2005); that possibly explains the need of multidisciplinary approach for the chronic TMJ pain that include, apart from the dentists, psychologists and psychiatrists. A pathological pathway for facial arthromyalgia or chronic TMD when jaw disability exists is suggested in relation to chewing, enjoyment of life, mood, relationships and sleep (Kafas and Leeson, 2006).

The acute pain is more likely to be defined as sharp, where the chronic as tender in statistically significant levels as shown. Furthermore, the previous results are not verification for the transition period between acute and chronic stage using the three months period of existence, as a time link. The Fig. 1 may be indicative for the progress of pain in different stages. Therefore, a future study is suggested by categorizing the sample according to time points. This may be found useful for the study of the transition period or end-start point.

The X chart for the character tender in acute and chronic group exhibit control. Therefore, the control limits may be adopted for future use. On the other hand the X chart for the sharp character in both groups showed that the process is out of control. This is because one point falls above upper control limit. The sigma level in both X charts was calculated to be three. Since, the sample of this study is small we considered these groups as an index for other TMJ pain studies.

The McGill questionnaire is a useful tool for differentiating the time related acute stage of TMJ pain from the chronic stage. Therefore, the history taking is the most important tool with the clinical examination in diagnosing these clinical entities. The correct diagnosis may be related to pain description leading the clinician to the proper management.

In conclusion, evaluation of pain characters using the above questionnaire might lead to indications for new assessment data regarding the status of the disorder since the clinical entity of facial arthromyalgia is a condition of undetermined etiology (Kafas *et al.*, 2007).

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