

CHRONIC PAIN EVALUATION FOR PATIENTS WITH ORTHODONTIC TREATMENT

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ABSTRACT

Aim of the study was to evaluate the presence, duration and intensity of chronic pain for orthodontic patients using the TMJ Scale questionnaire and to compare the data obtained. **Material and methods** The study included a total of 55 patients, ages 17 to 36 years, who were assessed for the presence, intensity and progression of chronic pain, chronicity and psychological factors, with a specific interpretation and statistical analysis performed using the SPSS 18.0 software. **Results** The presence of pain was reported at initial stage, at 1-3 months and 10-12 months - the intensity increased from 45.5% to 52.7% after 10-12 months monitoring, but with no statistically significant differences ($p = 0.622$). **Conclusions** The study highlighted and supported the need to assess the presence and intensity of chronic pain in patients with orthodontic treatment, and to establish a specific treatment to improve symptomatology.

Key words: orthodontic treatment, chronic pain, TMJ Scale, questionnaire

INTRODUCTION

The International Association for the Study of Pain has defined pain as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage"¹. For years many dentists have been convinced that occlusal discrepancies were the principal triggering factor for TMD but recent studies have concluded that they are only a secondary factor². In fact, the latest research in this area indicated that TMJ disorder is more complex than was previously thought. Psychosocial factors, physiological activity related to stress, and neuronal memory can influence and sustain the sensation of pain³. The purpose of the study was to evaluate the presence, duration and intensity of chronic pain in orthodontic patients using the TMJ Scale questionnaire and to compare the data with those of a control group of patients.

MATERIAL AND METHODS

The study group comprised 55 patients aged between 17 and 36 years. The purpose of the study was to evaluate the presence and intensity of chronic pain in patients with orthodontic treatments by applying the TMJ Scale questionnaire by comparing them with a control group of patients with orthodontic treatments but not having the same TMD symptomatology. The questionnaire was applied in the initial phase, 1-3 months of treatment and 10-12 months of orthodontic treatment. The data was uploaded and processed using statistical features in SPSS 18.0. Skewness, kurtosis ($-2 < p < 2$) and Shapiro-Wilk tests ($p > 0.05$), are tests of normality in frequentist statistics, available when using the distribution platform to examine a continuous variable. Skewness and Kurtosis tests ($-2 < p < 2$) suggested the data were normal (Fig. 1 and 2).

N	Valid	55
	Missing	0
Mean		24.42
Median		24.00
Std. Deviation		4.86
Variance		23.62
Skewness		.0267
Std. Error of Skewness		0.322
Kurtosis		-0.710
Std. Error of Kurtosis		0.634
Minimum		17
Maximum		36
Percentiles	25	21.00
	50	24.00
	75	28.00

Figure 1. Skewness and Kurtosis tests ($-2 < p < 2$) suggested the data were normal

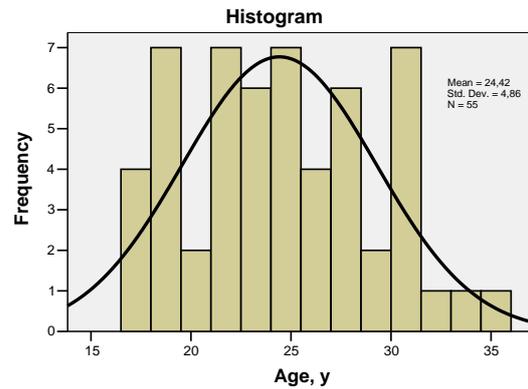


Figure 2. Histogram for Skewness and Kurtosis tests ($-2 < p < 2$) - data were normal

RESULTS AND DISCUSSIONS

Pain Report. The proportion of patients who consistently steady constantly responded to pain remained at 12.7% throughout the study period. The proportion of patients who responded periodically to rhythmically intermittently increase from 45.5% from initial stage to 52.7% after 10-12 months of follow-up, but differences were not

statistically significant ($p = 0.622$).

Percentage distribution of pain responses by gender did not differ significantly in any of the study periods, but it was noted that all patients with consistent constant steady pain response were under the age of 25 years.(Fig.3, Table 1)

Figure 3. Evolution of Pain Report during the study period

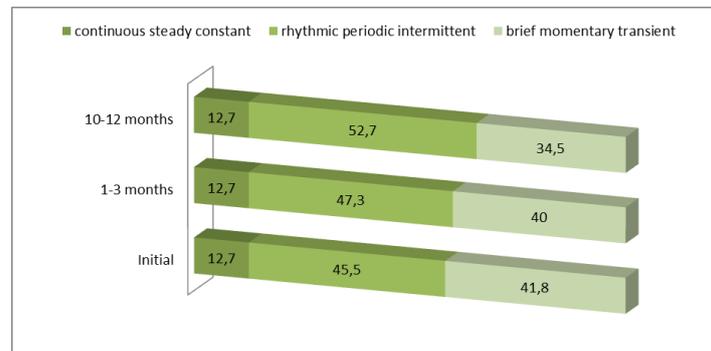


Table 1. Pain Report by gender and age groups during the study period

Pain report	N	%	from which			
			Female (%)	P*	≤25y (%)	P*
Initial						
continuous steady constant	7	12.7	57.1	0.502	100.0	0.019
rhythmic periodic intermittent	25	45.5	60.0		56.0	
brief momentary transient	23	41.8	43.5		52.2	
1-3 months						
continuous steady constant	7	12.7	57.1	0.935	100.0	0.017
rhythmic periodic intermittent	26	47.3	53.8		57.5	

brief momentary transient	22	40.0	50.0		50.0	
10-12 months						
continuous steady constant	7	12.7	57.1	0.516	100.0	0.020
rhythmic periodic intermittent	29	52.7	58.6		55.2	
brief momentary transient	19	34.5	42.1		52.6	

* P value for Kruskal-Wallis test

Intensity Pain Report. The proportion of patients who responded consistently to pain intensity remained at 12.7% throughout the study period. The proportion of patients who responded periodically to rhythmically intermittently increased from 50.9% from baseline to 63.6% after 10-12 months of follow-up. The percentage differences were not statistically significant ($p = 0.614$).

Psychological Factor. The proportion of patients who consistently steady constantly responded to psychological factors remained at a level of 12.7% throughout the study period. The proportion of patients who

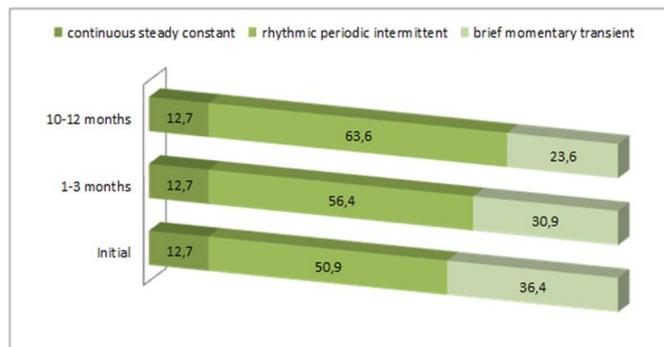
responded periodically to periodic rhythm increased from 43.6% from baseline to 61.8% after 10-12 months of follow-up. The percentage differences were not statistically significant ($p = 0.285$). The percentage distribution of responses for psychological factors by gender did not differ significantly in any of the study's moments, but it was noted that all patients with constant constant steady-on-pain response were aged under 25 and about 53-54 of responders intermittent periodic rhythm were below 25 years of age. (Fig.4, Table2)

Table 2. Psychological Factor by gender and age groups during the study period

Psychological Factor	N	%	from which			
			Female (%)	P*	≤25y (%)	P*
Initial						
continuous steady constant	7	12.7	57.1	0.339	100.0	0.020
rhythmic periodic intermittent	24	43.6	41.7		54.2	
brief momentary transient	24	43.6	62.5		54.2	
1-3 months						
continuous steady constant	7	12.7	57.1	0.193	100.0	0.013
rhythmic periodic intermittent	27	49.1	40.7		52.9	
brief momentary transient	21	38.2	66.7		57.1	
10-12 months						
continuous steady constant	7	12.7	57.1	0.211	100.0	0.019
rhythmic periodic intermittent	34	61.8	44.1		52.9	
brief momentary transient	14	25.2	71.4		57.1	

* P value for Kruskal-Wallis test

Figure 4. Evolution of Pain Report during the study period



Stress. The proportion of patients who consistently steady constantly responded to psychological factors remained at a level of 12.7% throughout the study period. The proportion of patients who responded periodically to rhythmically intermittently increased from 43.6% from baseline to 47.3% after 10-12 months of follow-up. The percentage differences were not statistically

significant ($p = 0.666$). (Table 3)

Percentage distribution of stress responses by gender did not differ significantly in any of the study's moments, but it was noted that all patients with consistent steady constant pain response were under the age of 25 and about 59-63 of the responders briefly at the momentary transition were under 25 years of age.

Table 3. Stress by gender and age groups during the study period

Stress	N	%	from which			
			Female (%)	P*	≤25y (%)	P*
Initial						
continuous steady constant	7	12.7	57.1	0.929	100.0	0.010
rhythmic periodic intermittent	24	43.6	50.0		48.8	
brief momentary transient	24	43.6	54.2		62.5	
1-3 months						
continuous steady constant	7	12.7	57.1	0.353	100.0	0.012
rhythmic periodic intermittent	18	32.7	38.9		44.4	
brief momentary transient	30	54.5	60.0		60.0	
10-12 months						
continuous steady constant	7	12.7	57.1	0.324	100.0	0.016
rhythmic periodic intermittent	26	47.3	42.3		50.0	
brief momentary transient	22	40.0	63.6		59.1	

* P value for Kruskal-Wallis test

Chronicity. The proportion of patients who responded periodically to rhythmically intermittently increase from 52.7% from baseline to 67.3% after 10-12 months of follow-up. The percentage differences were not statistically significant ($p = 0.666$).

Percentage distribution of stress responses by gender did not differ significantly in any of the study's moments, but it was noted that all patients with constant steady constant pain response were under the age of 25 and approximately 59-63 of the patients' responded intermittent periodic rhythm were below 25 years of age. (Table 4).

Percentage distribution of stress responses by gender did not differ

Table 4. Chronicity by gender and age groups in study period

Chronicity	N	%	from which			
			Female (%)	P*	≤25y (%)	P*
Initial						
continuous steady constant	7	12.7	57.1	0.967	100.0	0.015
rhythmic periodic intermittent	29	52.7	51.7		58.6	
brief momentary transient	19	34.5	52.6		47.4	
1-3 months						
continuous steady constant	7	12.7	57.1	0.414	100.0	0.008
rhythmic periodic intermittent	31	56.4	45.2		61.3	
brief momentary transient	17	30.9	64.7		41.2	
10-12 months						
continuous steady constant	7	12.7	57.1	0.952	100.0	0.016
rhythmic periodic intermittent	37	67.3	51.4		56.8	

brief momentary transient	11	20.0	54.5		45.5	
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* P value for Kruskal-Wallis test

The results of the study reported by Pocock et al⁴, support the use of the TMJ Scale as a valid instrument with which to determine whether there is any relationship between orthodontic therapy and TMD.

The results of similar studies of Yamaguchi et al⁵, (2002) were as follows: female patients in the symptom group in particular, showed a higher degree of stress due to the chronic pain and abnormalities than those in the non-symptom group. Significant differences were observed in

Pain Report, Joint Dysfunction and Global Scale at the 0.1% significant level, in Non-TM Disorder, Psychological Factor and Chronicity at the 1% level. The differences in the psychological factors between male and female patients were clarified by using the TMJ Scale. These findings suggested that it was useful to differentiate the multiple symptoms, especially the psychological factors, by using the TMJ Scale for orthodontic patients with TMD.

CONCLUSIONS

1. It is important to note the possibility to highlight and clarify the implication of psychological factors and stress-related aspects in patients with orthodontic treatment in terms of gender and age, using the TMJ scale for TMD patients.
2. The study revealed and supported the need to assess the intensity and pain report in patients with orthodontic

treatment, and find the possibilities to determine the factors involved and then correlated to orthodontic therapy and temporomandibular disorders, in order to subsequently establish a specific treatment to improve symptomatology.

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