

Muscle Tenderness, Stress, Anxiety and Depression in Patient with Temporomandibular Disorders

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Abstract

Background: Temporomandibular disorders (TMD) are one of the most communal musculoskeletal disorders. Sub-occipital muscle tenderness shows a significant role in the pathogenesis of TMD. This study was conducted to find out relationship between sub-occipital muscles tenderness, stress, anxiety and depression in patient with TMD. **Methods:** We recruited one hundred participants where were group A with 50 participants presenting with signs and symptoms of TMD and group B with 50 participants of normal individuals. Age of the participants was between 18-49 years. Sub-occipital muscle sensitivity was measured by Pressure Pain Threshold Algometer (PPT). DASS-21 (Depression Anxiety Stress Scale) was used to assess Stress, anxiety and depression. **Results:** Results of the study showed that 50 participants with (TMD) and 50 participants without TMD were participated in this study. Significantly significant difference was found between both the groups ($P < 0.05$). **Conclusion:** Participants with TMD showed low pain pressure threshold as well as depression, anxiety and stress as compare to normal control subjects. Therefore, it is important for the clinician to give importance to the sub-occipital muscles as well as the mental and psychological sphere for better management of TMD patients.

Keywords: Temporomandibular Disorders, Pressure Pain Threshold, Sub-Occipital Muscles, depression, anxiety and stress

Introduction

The pain which arise from temporomandibur joint, disk, masticatory muscles and related structures is known as Temporomandibular Disorder (TMD). This term is used to refer to a group of symptoms which involves the neuromuskuloskeletal structures around the Temporomandibular joint, ^[1] and the cost effects is very high. ^[2] The common clinical features exhibit as pain at orofacial area and ear, clicking and popping sounds, and limited jaw movements. ^[3-5] Due to CNS involvement, TMD patients show increased pain sensitivity and psychosomatic dysfunction. ^[5, 6] Study proved that in 70% of TMD patient shows neck pain. ^[7, 8] Neuroanatomical and functional networks between masticatory and cervical areas are debated as enlightenments for associated mandible and neck symptoms. ^[9] Recent study shown that psychoemotional burden is very common in patient with TMD. ^[10]

There is a relation between jaw, teeth, muscles of jaw and upper cervical spine with TMD dysfunction. On the off chance that further relationship is built up, new clinical systems that target the two regions ought to be considered and in this manner, the need of a multidisciplinary approach ought to be required for the treatment of TMD patients.

But, there are very few studies which show there is effect of TMJ dysfunction on sub-occipital muscles and vice versa. The main purpose of this study was to find out relationship between sub-occipital muscles tenderness, stress, anxiety and depression in patient with TMD.

Methods

Design

This study is an observational cross-sectional study and carried out during May 2018, Department of Physiotherapy, Lovely Professional University, Punjab. Total number of participants was one hundred. All were aged between 18 years to 49 years. In Group A 50 participants with TMD and group B 50 asymptomatic participants without any signs and symptoms of TMD were participated in this study. The participants were included for group A, pain and positive three finger test with limited MMO of less than 30mm (but not necessarily painful) clearly originating in the TMJ. For group B subjects normal healthy populations were included those who don't have history of disease.

The participants were excluded from the study for group A, those who are having history of hypertension, diabetes, asthma, epilepsy, and trauma to the maxillofacial area, any previous history of surgery to the maxillofacial area and malignancy.

Outcome measures

1. Tenderness

Tenderness was measured through digital pressure Algometer, FDX (Wagner, Greenwich, USA). Subjects were sat on stools and the algometer was placed on most painful area of subocipital muscle and the threshold of pain of the participants was assessed after applying pressure to algometer. The algometer automatically maintained the peak value and display on the screen;

2. Depression, anxiety, and stress

DASS-21 (Depression Anxiety Stress Scale) was used to assess depression, anxiety and stress. . The participants were approached to utilize a four-point severity/frequency scale to level the degree. Where they had encountered each state over earlier week.

3. Statistical analysis

Demographic data were descriptively analysed. Between the group comparisons unpaired t-test was used. SPSS 21 was used for statistical analysis of the data. The level of significance for the study was set as $p < 0.05$.

Results

Statistical analysis was carried out using SPSS 16 and paired t-test was used to compare the TMD and normal healthy population which are known to control group. Demographic variables (age, weight, height, BMI) are showing in the (Table-1). Statistical analysis (Table-2) revealed low PPT score among TMD patients.

Discussion

The main purpose of this study was to find out relationship between sub-occipital muscles tenderness, stress, anxiety and depression in patient with TMD. The results showed that there was a significantly significant difference between both the subjects with TMD in comparison with the normal healthy subjects ($P < 0.05$). Numerous studies scrutinised that the presence of signs and symptoms in the cervical area, stress and psychoemotional burden is very common in patient with TMD. ^[11-16]

Pain is a difficult phenomenon predisposed by both biologic and psychological reasons. ^[17] Several studies suggested that neck muscle tenderness in which palpation technique was used. ^[18, 19] It seems there is a relationship exist between mandible and Upper Cervical vertebra i.e. C1 and C2. During mastication of food, there are movement happening in the superior Cervical Spine in coordination with mouth depression and elevation as revealed by previous studies and that is again due to coordination of cervical muscles and muscles of mastication. Thus, the fixation or change in head position may cause alteration in movement of lower jaw. ^[18]

Biomechanical study proved that depression of mouth is directly associated with upper cervical spine extension. ^[16] Patients with TMD have revealed noteworthy restrictions in movement of superior cervical spine in compared to normal individuals. ^[15] Hence TMJ dysfunction can cause Neck dysfunction and vice versa.

Many study proved that sign and symptoms are present in cervical area those who are suffering with TMD and they have been showing that the presence of tenderness in the cervical musculature also which is in line with the findings of this study. ^[20-23] The outcomes of these studies recommend that a more integrated treatment approach including sub-occipital muscle assessment is important when handling patients with TMD.

Conclusion

In conclusion, subjects with TMD showed there was high relationship between the cervical muscle tenderness, depression, anxiety and stress. Therefore, for the better management of TMD clinician should consider these factors, otherwise treatment may become unproductive and may give rise to treatment failure.

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Conflict of Interest

-Author does not have any conflict of interest

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List of Table

Table 1: Demographic characteristics of data with TMD and without TMD (males and females). of figures entries found.

Variables	Subject with TMD	Subject without TMD	p-value
	Mean \pm SD	Mean \pm SD	
Age(y)	39 \pm 10.11	38 \pm 12.12	0.43
Weight(kg)	66.22 \pm 5.93	67.32 \pm 7.58	0.23
Height(cm)	163.34 \pm 8.52	164.33 \pm 7.24	0.45
Gender	Female (n=28) Male (n=22)	Female(n=30) Male (n=20)	
Body mass Index(kg/m ²)	22.55 \pm 3.65	23.32 \pm 3.15	0.44

Note=y-years, kg- kilogram, cm-centimetre, m-meter

Table 2: The comparison of the various scores between the subjects with TMD and without TMD (males and females).

Outcomes	Subject with TMD(N=50)	Subject without TMD(N=50)	p-value
	Mean \pm SD	Mean \pm SD	
PPT	3.77 \pm 0.16	6.77 \pm 0.16	0.001
Depression	2.99 \pm 3.44	5.61 \pm 4.97	0.001
Anxiety	2.75 \pm 3.26	5.16 \pm 4.04	0.001
Stress	5.55 \pm 3.62	9.19 \pm 6.97	0.001

PPT- Pressure Pain Threshold, TMD-temporomandibular disorders, SD-standard deviation