# The Relationship Between Clinical Parameters and Depression Level in Patients with Myofascial Pain Syndrome

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**ABSTRACT**

*Objective.* Several studies and reviews have documented the high degree of comorbidity between depression and chronic pain. It was reported that chronic muscle pain is frequently accompanied by symptoms of depression. The purpose of this study was then to investigate the prevalence of major depression in chronic pain patients (CPP) with myofascial pain syndrome (MPS) and to investigate the relationship between some clinical parameters and level of depression, utilizing a healthy control group without MPS.

*Design/Setting/Patients.* The study group consisted of 77 MPS patients (65 female, 12 male) and 72 healthy volunteers (60 female, 12 male). The diagnosis of MPS was based on clinical characteristics, examination findings, and ruling out other diagnoses. Major depressive disorder was diagnosed by a psychiatrist utilizing DSM-IV criteria. Levels of depression were obtained from the Beck Depression Inventory (BDI).

*Results.* There was no significant difference between MPS patients and controls with respect to age and gender ($P > 0.05$). The mean age of the patients was 31.1 years (SD 9.8) and the mean age of controls was 29.7 years (SD 7.1). Major depression was more frequently found in CPPs with MPS ($P < 0.001$). BDI scores were higher in the MPS group than in controls ($P < 0.001$). There was a significant correlation between the severity of pain and depression level in patients with MPS ($r = 0.654$, $P < 0.001$).

*Conclusion.* Major depression is found in MPS CPPs at a rate previously noted in the literature in mixed diagnoses CPPs. In addition, the severity of the depression may be related to perceived pain severity.

*Key Words.* Chronic Pain; Depression; Myofascial Pain

## Introduction

Myofascial pain syndrome (MPS) is characterized by local or referred pain, tightness, tenderness, stiffness and limitation of the movement, autonomic phenomena, local twitch response in the affected muscle, and muscle weakness without atrophy [1]. It is one of the common causes of chronic and widespread musculoskeletal pain [2]. Although neurological examination reveals no abnormalities, limb parasthesias and weakness are frequent complaints of MPS patients. MPS might be responsible for the unidentified causes of pain observed at different locations in patients. Erroneous diagnoses and inappropriate therapeutic approaches of MPS after onset may lead to the development of a complex chronic pain syndrome [3].

Various studies focused on the relationship of chronic pain and depression [4–7]. Researchers have found increasing evidence of depression in patients with chronic musculoskeletal disorders such as fibromyalgia, rheumatoid arthritis, and

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osteoarthritis [8–11]. Psychological factors have been implicated in the predisposition, initiation, and perpetuation of chronic pain [12]. Although chronic myofascial pain is not a psychological disorder, it can be associated with psychological disturbance [13,14].

The debate over whether pain causes depression or depression causes pain continues. The current thinking is that both can be correct and that the order in which they develop depends upon individual patients. It is often difficult to determine which came first. The pain–depression relationship in MPS patients has been examined in only a few studies [15]. Fishbain et al. [16] reported that depression and anxiety syndromes of various diagnostic types were the most frequently assigned axis I diagnoses in a group of chronic pain patients most of whom had a diagnosis of MPS. However, it should be noted that Fishbain et al. used DSM-III criteria. This is important because DSM-IV introduced a new diagnosis, pain disorder, to deal with pain. In a study examining 238 chronic pain patients with MPS [17], women with MPS were as likely as men with MPS to have current depression. Celic et al. [17] reported increased levels of depression and somatization in temporomandibular disorder patients. Yap et al. [12] reported that patients diagnosed with myofascial pain and other joint conditions had significantly higher levels of depression and somatization than patients diagnosed with only disk displacements. In both studies [12,18], somatization was defined as the process whereby a mental condition is experienced as a bodily symptom. Somatization is often confused with the DSM diagnosis of somatization disorder for which there are specific diagnostic criteria. Somatization is not a specific disease but rather a process with a spectrum of expression. Somatization disorder represents the most persistent, disabling, and costly form of somatization. It usually begins before the age of 30 years, may continue for years, and is distinguished, according to DSM-IV-TR, by "a combination of pain, gastrointestinal, sexual, and pseudoneurological symptoms" [19].

The purpose of this study was then to investigate the relationship between clinical parameters and the presence or absence of major depression and depression levels in patients who had MPS, utilizing a healthy control group without MPS. To our knowledge there has been only one study [20] investigating depression in MPS that has used a control group.

## Methods

### Participants

This study was conducted at the Physical Medicine and Rehabilitation Outpatients Clinic of Dicle University, Diyarbakir, south-eastern Turkey. A consecutive sample of outpatients with neck pain was screened for MPS. All patients had anteroposterior and oblique radiographs of cervical vertebral column. All patients' routine hematological and biochemical parameters were determined. In a 6-month period, among the 207 consecutive cases referred for the first assessment, 94 did not meet inclusion criteria and 36 subjects refused to participate. Seventy-seven patients (65 female, 12 male) with at least one trigger point located on shoulder muscles (upper, lower, and middle trapezius), with disease of at least 6 months' duration, were recruited in this study. The range of trigger point numbers was between 1 and 6 (mean 3.6, SD 1.4). All patients were informed about the study.

The control group consisted of 72 healthy individuals (60 female, 12 male). The controls were recruited from the family of those in the patients' group. Controls did not have chronic pain and any rheumatological disease. All controls had anteroposterior and oblique radiographs of the cervical vertebral column. Routine hematological and biochemical parameters were determined in controls. All subjects were informed about the study.

We did not include patients having a cervical or a shoulder surgery, diagnosed with fibromyalgia syndrome, cervical radiculopathy, myelopathy with severe disk or skeletal lesions, and neuromuscular or motor neuron diseases. Of 94 patients not meeting the inclusion criteria, 39 had cervical osteoarthritis, 17 had inflammatory rheumatic diseases, 13 had cervical radiculopathy, and 20 were pregnant or nursing mother. Five patients had been diagnosed as having depression before the disease onset. These cases were therefore excluded from the study.

### Procedures

The diagnosis of MPS was based on the following criteria: (1) presence of a tender spot characterized by spontaneous pain or associated with movement of the right or left superior trapezius muscle; (2) reproduction or enhancement of the clinical symptoms by compression of the active trigger points (TP); and (3) presence of a palpable taut band peripherally to the TP [4].

The severity of pain was self-evaluated by each patient using a linear visual analog scale (VAS) [21]. Functional status was assessed by the Neck Pain and Disability Scale (NPDS) [22]. It consists of 20 items that use a VAS to measure neck pain and associated problems. Scoring on each item ranges from 0 to 5, and NPDS score is produced by summing the item scores. Scores above 23 indicate clinically significant neck pain, and the higher the score, the greater the degree of the pain and disability. The Health Assessment Questionnaire (HAQ) is a measure of physical disability that has been developed and proved valid in chronic muscle pain [23].

The presence of major depressive disorder was diagnosed by a psychiatrist according to DSM-IV criteria [24]. The Turkish version of the Beck Depression Inventory (BDI) [25,26] was also administered. BDI contains 21 item sets, each with a series of four statements. Statements describe symptom severity along an ordinal continuum, from absent or mild (a score of 0) to severe (a score of 3). Depression severity scores are obtained by summing the scores of the items endorsed from each item set. The most recent guidelines suggest the following interpretation of severity scores: 0–9, minimal; 10–16, mild; 17–29, moderate; and 30–63, severe [27]. The BDI does not provide complete coverage of the symptoms used in the DSM-IV criteria, specifically items reflecting increase in appetite, increase in sleep, agitation, and psychomotor retardation. Therefore, the primary clinical use of the BDI was to assess the severity of depressive symptoms in patients with a previously diagnosed depressive illness.

One problem associated with questionnaires containing somatic items is that individuals with physical illnesses might endorse such items regardless of whether or not they are depressed. Thus, using the BDI total score to measure the severity of depression in a medical population may lead to elevated scores. Elevated scores might then translate into higher estimates of depression severity when symptomatology is actually related more to physical disorders than to an altered mood state. In fact, the BDI manual [28] suggests that the cognitive–affective subscale, which omits items considered indicative of somatic or performance complaints, be used to estimate severity of depression in persons whose vegetative and somatic symptoms might lead to an overestimation of depressive symptomatology [29]. In the present study, the cognitive–affective subscale of BDI (the sum of the first 13 items) was used to avoid such overestimation of depressive symptomatology.

### Analyses
Student's *t*-test and Pearson's correlation analyses were performed by using the Statistical Package for Social Sciences (SPSS 11.5, SPSS Inc, Chicago, IL) and $P = 0.05$ was considered statistically significant.

### Results

Demographic and clinical data of patients with myofascial TP located on shoulder muscles and healthy controls are shown in Table 1. Mean ages of patients and control groups were 31.1 years (SD 6.1) and 29.02 years (SD 6.9). There was no significant difference between the two groups with respect to age and gender ($P > 0.05$). BDI, Neck Pain and Disability Index, HAQ scores, and mean VAS values were higher in patients than in healthy controls ($P < 0.001$ for each scale). Furthermore, there was a significant positive correlation between BDI cognitive–affective subscale and VAS scores ($r = 0.654$, $P < 0.001$). Thirty patients with MPS (39%) and three controls (4%) were ($\chi^2 = 26.12$, $P < 0.001$) were diagnosed with major depressive disorder according to DSM-IV criteria.

### Discussion

The incidence of current major depression among chronic pain patients ranges from 30% to 54% [30]. Our findings on the rate of major depression among patients with MPS are comparable to these results and are statistically more prevalent in the MPS group than in controls.

**Table 1** Demographic and clinical data of patients who had myofascial trigger points located on shoulder muscles and healthy controls

| | Patients (*n* = 77) | Controls (*n* = 72) | *P* |
|---|---|---|---|
| Age | 31.1 (SD 6.1) | 29.02 (SD 6.9) | NS |
| Sex (female/male) | 65/12 | 60/12 | NS |
| VAS | 6.4 (SD 1.6) | 3.6 (SD 1.5) | $P < 0.001$ |
| NPAS | 59.5 (SD 12.9) | 20.7 (SD 5.7) | $P < 0.001$ |
| Frequency of major depression | 39% (*n* = 30) | 4% (*n* = 3) | $P < 0.001$ |
| BDI cognitive-affective subscale | 12.2 (SD 2.6) | 2.4 (SD 1.4) | $P < 0.001$ |
| HAQ | 0.8 (SD 0.8) | 0.1 (SD 0.9) | $P < 0.001$ |

VAS = visual analog scale; NPAD = Neck Pain and Disability Scale; BDI = Beck Depression Inventory; HAQ = Health Assessment Questionnaire; NS = not significant.

We found higher levels of depression and physical disability in patients with MPS and a relationship between pain intensity and the level of depressive symptoms as measured by BDI. Similarly, Esenyel et al. [31] reported that there is a positive correlation between the level of depression and pain intensity in patients who had myofascial TP in one side of the upper trapezius.

From a reverse treatment of pain perspective, Gur et al. [32] conducted a prospective, double-blind, randomized, and controlled trial in patients with chronic MPS in the neck to evaluate the effects of infrared low level 904 nm gallium–arsenide laser therapy. In the active laser group, statistically significant improvements were detected in BDI scores compared with baseline, while in the placebo laser group, no significant improvement was detected. Depressive symptoms were decreased in parallel with pain scores. These results may support the "consequence hypothesis" [33], which suggests that depression follows the development of chronic pain, and also indirectly support our findings. Our findings are also supported by the only other study [20] of patients with MPS in which a control group was utilized.

Velly et al. [20] investigated the contributing factors for chronic masticatory myofascial pain. The results revealed that a higher score of depression and anxiety were associated with masticatory myofascial pain, as well as other psychological symptoms, compared with the controls selected from the nonspecialized temporomandibular disorders clinic.

What are more confounders to this study? One major confounder is that the diagnosis of major depression was arrived at by only one psychiatrist or one independent rater, although DSM-IV criteria were utilized. Thus, the validity of each major depression diagnosis was not independently collaborated by a second rater. In addition, the validity of the major depression diagnoses may be in question. Second, the DSM-IV diagnoses of major depression contain a number of somatic symptom criteria such as sleep, fatigue, and so on. There is now some evidence [34,35] that some somatic symptoms of depression in CPPs may actually be a function of pain rather than depression. This issue could also have served as a second confounder to the diagnosis of major depression in this study. The third potential confounder relates to the actual diagnoses of MPS. It is well known that physical findings in CPPs lack test–retest reliability and validity (examiner to examiner) [36,37]. Ideally, in this study two independent examiners'

scores should have been utilized and a physical finding accepted as being present only if there was mutual agreement between the examiners. As this was not the case in this study, this problem could have served as a potential confounder to the results. Finally, it is also unclear whether utilizing the BDI cognitive–affective subscale circumvented the somatic symptoms–depression problem outlined in the proceeding section.

## Conclusion

Our findings then indicate that major depression is frequently found in MPS at rates previously noted for CPPs. In addition, it appears that the severity of the depression in MPS is related to perceived pain severity.

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