

# Psychological Disturbance in Fibromyalgia: Relation to Pain Severity

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**Summary** Fibromyalgia is a form of nonarticular rheumatism characterized by musculoskeletal aching and tenderness on palpation. The role of psychological factors in fibromyalgia has been controversial. The aim of this study was to evaluate the relationship of fibromyalgia to the intensity of anxiety and depression and to determine the correlation between psychological disturbances with disease duration and pain severity.

Thirty-nine patients with fibromyalgia and 36 healthy controls were included in this study. Beck depression inventory, State and trait anxiety inventory and Beck hopelessness scale were used to evaluate psychological disturbances. Visual analog scale was used to determine pain intensity.

We found a significant difference in the psychological status between patients with fibromyalgia and control subjects as measured by Beck depression inventory and trait anxiety inventory; 35.9% of the patients scored higher than the cut-off score on the Beck depression rating scale. Pain severity was found to be correlated with trait anxiety inventory scores. These results suggest that somatic expression of depression is an important difference between fibromyalgia and control groups. The difference between state and trait anxiety inventory reflects that current anxiety is not secondary to pain but trait anxiety is possibly causally related to pain.

**Key words** Fibromyalgia, Psychology, Depression, Anxiety.

## INTRODUCTION

Fibromyalgia is a form of nonarticular rheumatism characterized by musculoskeletal aching and tenderness on palpation of tendinomusculoskeletal sites called tender points (1-4). Symptoms are usually aggravated by cold, humid weather, tension and inactivity and eased by heat, moderate activity or vacation (1). Generalized aches and pains, as well as stiffness are the most common rheumatic symptoms (2,3). The rheumatic manifestations are typically associated with many extraarticular complaints such as tiredness, anxiety, sleep problems, headaches, irritable bowel syndrome and numbness (1-4).

The role of psychological factors in fibromyalgia have been controversial and the question whether psychological factors could play an aetiological role in the condition remains a matter of debate in the literature (5). Use of the Minnesota Multiphasic Personality Inventory (MMPI) assessment has shown psychological abnormal-

ities in a subgroup of fibromyalgia patients compared with normal controls and with rheumatoid arthritis (RA) patients (6-8).

The aim of this study was to evaluate the relation of fibromyalgia to the intensity of anxiety and depression, to determine the correlation between psychological disturbances with disease duration and pain severity and to compare the results with the healthy control group.

## MATERIALS AND METHODS

Thirty-nine patients with fibromyalgia who fulfilled the diagnostic criteria designed by the American College of Rheumatology (1990) (2) and 36 healthy control subjects were included in this study. A detailed physical examination of the musculoskeletal system was made for diagnosis and patients with a disease duration of at least 6 months were selected. Patients with a history of trauma and organic systemic illness were excluded. Information was collected on some clinical variables associated with fibromyalgia and the total number of somatic symptoms were recorded.

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Thirty-four (87.2%) of the fibromyalgia patients were female and 5 (12.8%) were male with ages ranging from 17 to 56 years (mean  $30.3 \pm 8.1$  years) and with a mean symptom duration of  $37.6 \pm 32.9$  months (range: 6-120 months). The mean age of the control group was  $31.1 \pm 11.0$  years and there was no significant difference between groups. Twenty-six of (72.2%) the control subjects were female.

Complete blood count, erythrocyte sedimentation rate, serum chemistry profile including proteins, BUN, creatinine and liver enzymes and serologic tests were all normal in patients with fibromyalgia.

All patients rated their pain on a 10 cm visual analog scale (VAS), anchored at 0=no pain and 10=worst pain imaginable. Beck Depression Inventory, Spielberger State and Trait Anxiety Inventory and Beck Hopelessness Scale were used to evaluate psychological disturbances.

Beck Depression Inventory (BDI) is an inventory consisting of 21 questions with regard to symptoms and attitudes describing particular manifestations of depression, each category consisting of a series of 4 self-evaluative statements which are assigned values from 0-3 to indicate the degree of severity. The total score is obtained by adding scores of the individual symptom categories, and range from 0 to 63 (9-10). A score of 14-24 is indicative of moderate depressive symptoms and a score of 25 or greater is indicative of clinically significant major depression for our population.

Beck Hopelessness Scale is a 20-item true-false questionnaire assessing negative expectations and pessimism about one's future. One half of the items are reverse scored. Total scores can range from 0 to 20 and are obtained by summing up the individual items. A score of 13 or greater is indicative of significant hopelessness (11).

Spielberger State and Trait Anxiety Inventory (STAI) consists of 40 self-report questions graded 1 (almost never) to 4 (almost always), measuring A-State, a transitory state of anxiety (questions 1-20) and A-Trait, the tendency one has to respond to situations perceived as threatening with an increase in anxiety state (questions 21-40). Scores range from 20-80 for both A-State and A-Trait, with the higher scores indicating higher levels of anxiety (10).

Statistical analysis was done using Student's t test, Fischer's exact test and Pearson correlation matrix.

## RESULTS

The distribution of common clinical and associated features of fibromyalgia are presented in Table I. The most frequent manifestations were sleep disturbance, fatigue and tiredness. The mean score on the Beck De-

Table I: Percent frequency of selected manifestations in fibromyalgia patients

	No.	%
Sleep disturbance	34	87.2
Fatigue and tiredness	30	76.9
Chronic headache	29	74.4
Anxiety	29	74.4
Vertigo	25	64.1
Numbness	24	61.5
Dysmenorrhoea	23	58.9
Pollakiuria	20	51.3
Palpitation	19	48.7
Abdominal distention	19	48.7
Irritable bowel	19	48.7
Chest pain	17	43.6
Dyspnoea	17	43.6
Subjective swelling	14	35.9

Table II: Psychological test results in fibromyalgia and control groups

	Fibromyalgia	Control	P
BDI	$13.2 \pm 7.5$	$4.6 \pm 4.9$	< 0.05
BHS	$5.5 \pm 3.7$	$4.0 \pm 3.6$	> 0.05
SAI	$41.6 \pm 8.5$	$38.6 \pm 10.8$	> 0.05
TAI	$48.5 \pm 7.8$	$41.2 \pm 5.7$	< 0.05

BDI: Beck Depression Inventory

BHS: Beck Hopelessness Scale

SAI: State Anxiety Inventory

TAI: Trait Anxiety Inventory

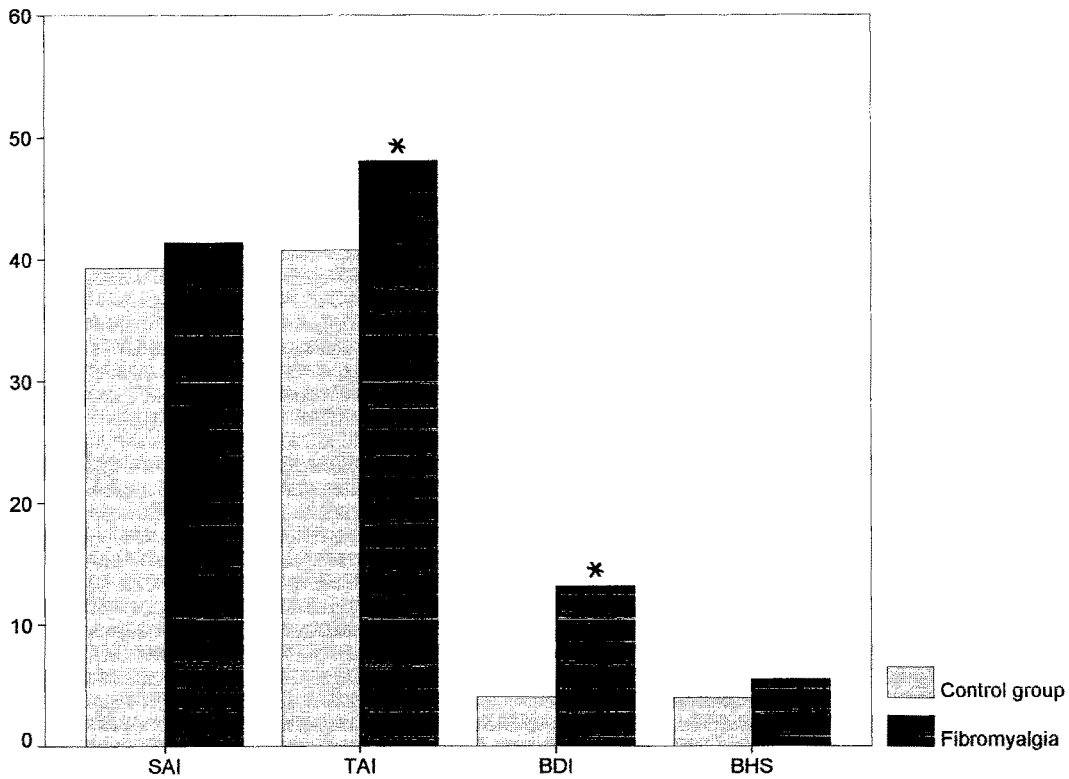
Table III: Depression in fibromyalgia and control groups

	Major depression (25-63)	Moderate depression (14-24)	Total
Fibromyalgia	2 (5.1%)	12 (30.8%)	14 (35.9%)
Control	-	2 (5.6%)	2 (5.6%)

$p > 0.05$

pression Inventory was  $13.2 \pm 7.5$  (range 0-35), 30.8% of the scores was between 14-24 (moderate depression), and 5.1% was > 25 (major depression). The mean score on the Beck Depression Inventory in the control group was  $4.6 \pm 4.9$ . We found a significant difference in the psychological status of patients with fibromyalgia as opposed to control subjects as measured by the Beck Depression Inventory ( $p < 0.5$ ) (Table II) (Fig. 1); 35.9% of the patients scored higher than the cut-off score and in the control group there were only 2 subjects (5.6%) who had moderate depression (Table III) but this difference was not statistically significant.

The mean Beck Hopelessness Scale score was  $5.5 \pm 3.7$  in the fibromyalgia group and  $4.0 \pm 3.6$  in the control group. Although there was a difference between groups this was not statistically significant ( $p > 0.05$ ) (Table II).



\*:  $p < 0.05$

Fig. 1: Psychological test results in fibromyalgia and control groups.

Trait anxiety inventory scores ranged from 36 to 63 with a mean of  $48.4 \pm 7.8$  in the fibromyalgia group and  $41.2 \pm 5.7$  in the control group. The mean state anxiety inventory score was  $41.6 \pm 8.5$  (range: 24-58) in fibromyalgia patients and  $38.6 \pm 10.6$  in control subjects. There was a significant difference between groups in trait anxiety scores ( $p < 0.05$ ) but not in state anxiety scores ( $p > 0.05$ ) (Table II).

The statistics were repeated for the female patients and control subjects. The mean age of the female patient and control groups was  $31.05 \pm 8.3$  and  $30.5 \pm 8.2$  years respectively and there was no significant difference. The mean Beck depression scale and trait anxiety inventory scores were significantly higher in the female fibromyalgia patients compared with the female control subjects.

The mean VAS was  $5.25 \pm 1.93$  cm in fibromyalgia patients (range: 0.6-8.6 cm) and pain severity was found to be correlated only with trait anxiety inventory scores ( $r = 0.3328$ ,  $p < 0.05$ ) (Fig. 2). Psychological test results were not correlated with disease duration ( $p > 0.05$ ) and total number of somatic symptoms ( $p > 0.05$ ). Beck Depression Inventory and Beck Hopelessness Scale scores

were correlated with State and Trait Anxiety Inventory scores ( $p < 0.05$ ).

## DISCUSSION

The association between psychological factors and fibromyalgia has previously been investigated with conflicting results. The existence of an association between chronic pain and depression has long been suggested. It is proposed that the psychological aspects of fibromyalgia were similar to those of other patients with chronic pain (12).

Payne et al. (7) compared the findings on the MMPI in fibromyalgia and RA and found that MMPI profiles were higher in fibromyalgia patients and only the hypochondrial and hysteria scales were in the pathologic range. They concluded that fibromyalgia patients were more psychologically disturbed than patients with RA and believed that psychological disturbance was probably not the result of chronic pain and disability, since patients who had RA or other arthritic diseases were not similarly disturbed. Ahles et al. (6) reported that 31% of the fibromyalgia patients were psychologically disturbed,

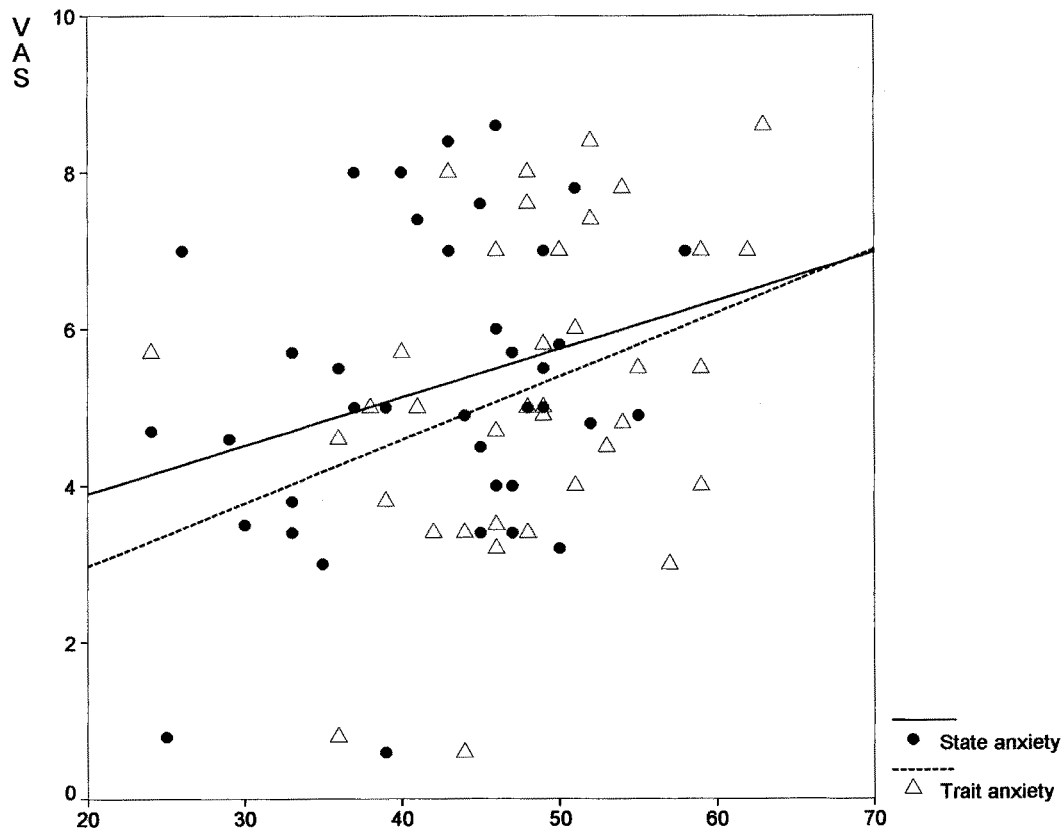


Fig. 2: Pain severity as related to state anxiety ( $r = .2706$ ,  $p > 0.05$ ) and trait anxiety ( $r = .3328$ ,  $p < 0.05$ ) inventory scores.

33% had a typical pain profile and 36% were normal. Hudson et al. (13) found a significantly higher occurrence of a history of major depression (71%) in fibromyalgia patients than in arthritis patients (13%). Current major depression was present in 26% of the fibromyalgia patients in comparison to none of the RA patients and suggested that fibromyalgia might be a form of major affective disorder in which certain somatic symptoms are prominent.

Several studies, however, fail to support a major role for psychological factors in either development or expression of fibromyalgia (14,15). Clark et al. (14) found no significant differences on the Symptom Checklist-90-Revised, the Beck Depression Inventory and the Spielberger State-Trait Anxiety Inventory, between fibromyalgia patients and a control sample of general medical patients. Kirmayer et al. (16) found no significant differences in the occurrence of depression between fibromyalgia patients (20%) and arthritis patients (8.7%) and concluded that somatization could result from socio-psychological processes including increased focus on the body, hypochondriacal worry and attribution of emotional distress to somatic causes, which lead to more symptom reporting and help seeking. Ahles et al. (17) found

that 42.9% of the fibromyalgia patients, 39.4% of the arthritis patients and 25.8% of subjects without pain had major depression. Their data revealed no group differences in terms of lifetime history of any psychiatric disorders, including major depression, somatization disorder or anxiety-based disorder. Of our patients with fibromyalgia 35.9% presented depressive symptoms in comparison with a low frequency (5.6%) in the healthy controls. The mean Beck depression inventory scores were significantly higher than in the control subjects but the Beck hopelessness scale results which reflect the global, pessimistic beliefs about oneself and the future were not different from the control group. This may be explained by the spectrum of the Beck depression inventory which asks the respondent to indicate how he or she has felt over the last several days and includes somatic items. This suggests that somatic expression of depression is the important difference between fibromyalgia and control groups.

Anxiety is another important factor in fibromyalgia. Yunus et al. (1) reported that 70% of their patients admitted to being anxious and in 68% symptoms were made worse by anxiety and mental stress, but they found that anxiety does not correlate with all manifestations of fi-

bromyalgia. In our study 74.4% of the patients described anxiety and 79.4% reported anxiety as a modulating factor. The state anxiety scores were not different, but trait anxiety scores were significantly higher in the fibromyalgia group. There was also a correlation between trait anxiety scores and pain intensity. These results suggest that symptoms of anxiety across situations are more evident than the intensity of current anxiety symptoms. The difference between state and trait anxiety inventory results reflects that current anxiety is not secondary to pain but trait anxiety is possibly causally related to pain.

It is suggested that for the severity of fibromyalgia, pain was the most important determinant (18). Central features of fibromyalgia were found to be independent of psychological status but the psychological status was reported to be related to pain scoring (19,20). Viitanen (21) et al., however, could not find a correlation between depression score and pain intensity and concluded that depression was not able to explain the high pain intensity in fibromyalgia patients. In our study we found a correlation only between trait anxiety score and pain severity.

Patients with fibromyalgia have been reported to display high rates of several concomitant disorders includ-

ing migraine, irritable bowel syndrome, chronic fatigue syndrome, major depression and panic disorder and this is consistent with the hypothesis that these various disorders may share a common physiologic abnormality (22).

Several studies have shown that central serotonin activity may regulate pain severity and sleep. Because pain and sleep symptoms are prominent in fibromyalgia, it has been speculated that fibromyalgia is associated with disturbed serotonin metabolism and a relative serotonin deficiency, but the results are conflicting in the literature (23,24). Plasma and urinary catecholamine levels which reflect sympathetic activity were not correlated with anxiety, depression or stress in fibromyalgia (25).

Tricyclic antidepressants are used in much smaller doses than those recommended for the treatment at major depression (26), but the use of antidepressant therapy was of limited benefit in some patients (27). As some of the patients have depressive symptoms, it would be preferable to treat this subgroup with special care including a clinical psychiatric assessment, and the other chronic pain syndromes ought to be evaluated with these psychological tests to assess the relationship between emotional distress and clinical variables.

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