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# Determination of fibromyalgia syndrome in patients with non-cardiac chest pain in accordance with 1990 and 2010 diagnostic criteria

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**Abstract**

To determine the frequency of Fibromyalgia syndrome (FMS) in accordance with the American College of Rheumatology (ACR) 1990 and ACR 2010 FMS classification criteria, also to assess the pain intensity, functional and emotional status of patients whoare admitted to the cardiology clinic with a complaint of chest pain without a cardiologic pathology. 107 female patients with chest pain, who admitted to cardiology polyclinic after discarding cardiac chest pain, directed to Physical Medicine and Rehabilitation polyclinic, were included to the study. All patients were assessed in terms of age, height, weight, body mass index (BMI), chronic pain duration, Visual Analog Scale (VAS), Fibromyalgia Impact Questionnaire (FIQ), Widespread Pain Index (WPI), Symptom Severity Scale (SS) and Back Anxiety Depression Scale (BADS). The ACR was assessed according to the 1990 and 2010 FMS classification criteria. It was found that 3(2.8%) of these patients met only the 1990 criteria, 3(2.8%) only met the 2010 criteria and 16(15%) met both the 1990 and 2010 criteria, but 85(79.4) did not meet any of the criteria. The number of tender points, WPI, SS and FIQ values of the clinical and functional evaluation parameters of FMS were higher in the FMS group and this result was statistically significant ($p<0.001$). The frequency of FMS in patients with non-cardiac chest pain (NCCP) is similar to the frequency of FMS in general population. In patients with NCCP, FMS is a diagnosis that should be taken into account.

**Keywords:** Non-cardiac chest pain, fibromyalgia syndrome

## Introduction

Chronic widespread pain syndromes have been known for several centuries. However, recently, FMS has been described as a separate disorder. Over time, the relationship between visceral pain and fibrosis has begun to be understood. Fibromyalgia syndrome (FMS) is a clinical tablature without specific laboratory findings in which painful tender points (TP) are detected by palpation of the physical examination with diffuse pain and stiffness in the musculoskeletal system [1,2]. Although etiology and pathophysiology are not fully understood, neuroendocrine dysfunctions, central pain mechanisms and central sensitivity are the most important factors [3-5].

Raynaud's phenomenon, sickle symptoms, reticular skin color change, restless legs syndrome, hypermobility syndrome, skin sensitivity, dysmenorrhea, subjective swelling in hands, headache, dizziness, headache, irritable bowel and bladder syndrome, abdominal and chest pain, jaw pain, Raynaud's phenomenology, paresthesia, and mitral valve prolapse are accompanied by symptoms and complaints [6,7].

Chest pain can be caused by many causes. Chest wall and neck musculoskeletal structures are the most common causes of chest pain. The pain resulting from these structures can often be confused with angina pectoris, pleurisy and other visceral diseases [8]. FMS syndrome often causes chest pain. Touching, moving and breathing on the chest wall in FMS patients can increase chest pain. Patients with FMS are frequently seen as chronic fatigue, intestinal dysfunction, or mood disorders [9]. Although there are problems with non-cardiac chest pain (NCCP), which usually involve the musculoskeletal system, there are few studies showing the prevalence of FMS in NCCP.

Many FMS patients do not fully meet the standard diagnostic criteria. Since health workers often diagnose FMS by excluding other diagnoses, as there is no definite, definitive diagnostic criterion, FMS should not be considered an exclusion diagnosis (10). Since symptoms are widespread and ambiguous, it is difficult to diagnose FMS and often the diagnosis can be skipped. However, pain, fatigue and sleep disturbance are

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the three main symptoms seen in almost all patients [11,12].

The aim of this study is to determine the frequency of FMS according to the American College of Rheumatology (ACR) 1990 and ACR 2010 FMS classification criteria in patients with a chest pain complaint without a cardiological pathology and to evaluate of pain severity, functional and emotional status, and the relationship between non-cardiac chest pain and disease parameters of FMS.

## Material and Methods

### Patients

107 female patients were included in the study.The patients applied to the Cardiology polyclinic with chest pain and referred to the Physical Medicine and Rehabilitation outpatient clinic after cardiac chest pain was excluded. A local ethics committee approved the study and a written informed consent was obtained from all patients. Patients who were younger than 18 years and older than 65 years, patients with systemic inflammatory rheumatic disease, patients who could not be contacted in terms of sociocultural status, patients with acute or known clinical disorder (malignancy, fracture etc.) at work time and pregnant patients were not included. None of the patients had antidepressant medication, muscle relaxants or analgesic use, and only those who stopped taking medication at least 3 weeks prior to work were included in the study.

### Clinical evaluations

All patients were filled in a structured form that covers age, height, weight, body mass index (BMI), duration of chronic pain, widespread pain, and accompanying symptoms.

All patients' chest painswere assessed on a 100 mm Visuel Analogue Scale (VAS), which was looked by the patient and the physician. The disease severity was determined by the Turkish version of the Fibromyalgia Effect Questionnaire (FIQ) in both groups of patients. All patients received the Widespread Pain Index (WPI) and Symptom Severity (SS) scale, which were used in the 2010 FMS classification criteria. Back Anxiety and Depression Scale (BADS) was used to assess emotional status in all patients with chronic chest pain.

All NCCP patients studied were evaluated by a specialist physician according to ACR 1990 and 2010 FMS classification criteria for FMS presence. Patients with a widespread pain that lasted for at least 3 months according to the criteria developed by ACR in 1990, and at least 11 of the 18 digital palpation-tender points were evaluated as FMS . In the same way, all patients with a WPI≥7 and an SS scale score≥5 or a WPI 3-6 and an SS scale score≥9 according to the criteria developed by ACR in 2010 and whose symptoms persisted at similar level for at least 3 months, patients without impairment were evaluated as FMS [13].Patients with chest pain who met both or only met one of the ACR 1990 and 2010 classification criteria constituted the FMS group, while those with chest pain who did not meet both of these criteria constituted the non-FMS group.

Besides, whole blood count, erythrocyte sedimentation rate, serum CRP, RF values and routine biochemical values of all patients were evaluated.

The results were evaluated using SPSS (IBM, SPSS Statistics for Windows, Version 20.0, Armonk, NY: IBM Corp.). The results were evaluated using parametric and nonparametric statistical methods for data with normal and non-normal distribution. Comparisons between groups were made using independent group t tests for parametric values and Mann-Whitney U tests for nonparametric values. Categorical data were analyzed by Chi - square test. Correlations between the parameters were assessed using Spearman and Pearson correlation analysis. Data descriptive statistical methods were taken $p<0.05$ for statistical significance. The results are given as mean±standard deviation.

## Results

The mean age of all NCCP patients was 41.93±10.45 and the mean duration of chest pain was 3.40±3.90 months. The mean VAS scores of 107 patients' chest pain evaluated by the patient and the doctor were 45.50±26.10 and 32.70±24.50, respectively. All patients had moderate pain. The mean number of tender points in all patients was 5.80±4.52.85(79.4%) patients were premenopausal and the remaining 22 patients were in peri and postmenopausal period (Table 1). Of the total 107 patients who were evaluated according to the 1990 and 2010 FMS classification criteria of ACR, 3(2.8%) only met the 1990 criteria, 3(2.8%) only the 2010 criteria and 16(15% but 85(79.4) did not meet any of the criteria (Table 1).

**Table 1.** Demographic and clinical parameters of all chest pain patients

| | | All Patients with Chest Pain (n:107) |
|---|---|---|
| Age (years) | | 41.93±10.45 (20–65) |
| Height (cm) | | 162.20±5.54 (150–173) |
| Weight (kg) | | 69.87±11.65 (47–96) |
| BMI (kg/cm2) | | 26.58±4.44 (17.27–40.17) |
| Pain duration (month) | | 3.40±3.90 (1–20) |
| Patient's pain assessment (0-100 mm VAS) | | 45.5±26.1 (1–100) |
| Physician's pain assessment (0-100 mm VAS) | | 32.7±24.5 (0–80) |
| Tender point count (0-18) | | 5.80±4.52 (0-18) |
| FIQ (0-100) | | 40.38±19.22 (6.29–89.08) |
| WPI (0-19) | | 4.91±2.95 (1–18) |
| SS scale (0-39) | | 3.94±2.35 (1–10) |
| BDI (0-21) | | 9.88±9.26 (0–38) |
| BAI (0-21) | | 10.86±9.91 (0–55) |
| Menopause situation | Premenopausal | 85 (%79.4) |
| N (%) | Perimenopausal | 10 (%9.3) |
| | Postmenopausal | 12 (%11.2) |
| Working status | Housewife | 46 (%43) |
| N (%) | Working | 56 (%52.3) |
| | Student | 5 (%4.7) |
| ACR Fibromyalgia Classification Criterion N (%) | 1990 ACR+ | 3 (%2.8) |
| | 2010 ACR+ | 3 (%2.8) |
| | Both of them+ | 16 (%15) |
| | None | 85 (79.4) |

FMS: Fibromyalgia syndrome, VAS: Visual analog scale, BMI: Body mass index, FIQ: Fibromyalgia Impact Questionnaire, WPI: Widespread Pain Index, SS: Symptom Severity, BDI: Back Depression Inventory, BAI: Back Anxiety Inventory, ACR: American Collage of Rheumatology

The demographic and clinical data of patients with FMS diagnosis (n:22) and patients without FMS (n:85) according to the 1990 and 2010 ACR FMS classification criteria are shown in Table 2. The mean age of the FMS group was 44.00±9.20, while the mean age of the non-FMS group was 41.39±10.73 and there was no statistical difference between them (p>0,05). There was no significant difference between the two groups in terms of height, weight and BMI (p>0,05). Mean duration of chest pain was 7.82±5.82 months in the FMS group and significantly higher in the non-FMS group (2.26±2.07) (p<0.001) (Table 2). The mean VAS scores evaluated by patients and doctors were significantly higher than those of non-FMS group (p<0.001). Among the other clinical and functional evaluation parameters of FMS, the number of tender points, WPI, SS and FIQ values were high in the FMS group, which was statistically significant (p<0.001) (Table2). In the FMS group, 15(68.2%) patients were in the perimenopausal period and 7(31.8%) were in the peri and postmenopausal period. In the non-FMS group, 70(82.4%) were premenopausal and 15(17.6%) were in the peri- and postmenopausal period (Table 2).

In the FMSgroup with NCCP, correlations between chest pain VAS scores and clinical parameters are shown in Table 3.There was a positive correlation between the VAS pain scores evaluated by the physician and the BAI, BDI, pain duration and height (p<0.05) (Table 3), while the VAS pain scores evaluated by the patient were positively correlated with SS scale, FIQ, BDI scores and height ).

**Table 2.** Comparison of demographic and clinical parameters between non-cardiac chest painful FMS group and non-FMS group

| | | FMS Group (n:22) | Non FMS Group (n:85) | p |
|---|---|---|---|---|
| **Age (years)** | | 44±9.20 (29–61) | 41.39±10.73 (20–65) | 0.318 |
| **Height (cm)** | | 161.54±5.82 (150–173) | 162.37±5.49 (150–172) | 0.408 |
| **Weight (kg)** | | 72.90±13.29 (51–96) | 69.08±11.14 (47–94) | 0.181 |
| **BMI (kg/cm2)** | | 27.97±5.23 (19.80–39.50) | 26.22±4.17 (17.27–40.17) | 0.118 |
| **Pain duration (month)** | | 7.82±5.82 (2–20) | 2.26±2.07 (1–10) | <0.001 |
| **Patient's pain assessment (0-100 mm VAS)** | | 69.5±19.8 (2–100) | 39.3±23.8 (1–90) | <0.001 |
| **Physician's pain assessment (0-100 mm VAS)** | | 55.9±15.0 (2–80) | 26.7±22.9 (0–70) | <0.001 |
| **Tender point count (0-18)** | | 12.18±2.92 (6-18) | 4.15±3.20 (0-10) | <0.001 |
| **FIQ (0-100)** | | 59.56±16.26 (28.19–89.08) | 35.42±16.7 (6.29 –67.52) | <0.001 |
| **WPI (0-19)** | | 9±3.52 (5–18) | 3.85±1.53 (1–10) | <0.001 |
| **SS scale (0-39)** | | 6.73±2.14 (2–10) | 3.22±1.81 (1–8) | <0.001 |
| **BDI (0-21)** | | 21.18±11.74 (6–55) | 8.19±7.38 (0–32) | <0.001 |
| **BAI (0-21)** | | 19.45±9.48 (6–38) | 7.40±7.45 (0–31) | <0.001 |
| **Menopause situation** | Premenopausal | 15 (%68.2) | 70 (%82.4) | 0.335 |
| **N (%)** | Perimenopausal | 3 (%13.6) | 7 (%8.2) | |
| | Postmenopausal | 4 (%18.2) | 8 (%9.4) | |
| **Working status** | Housewife | 16 (%72.7) | 30 (%35.3) | 0.006 |
| **N (%)** | Working | 5 (%22.7) | 51 (%60) | <0.05 |
| | Student | 1 (%4.5) | 4 (%4.7) | |
| **ACR Fibromyalgia Classification Criterion N (%)** | 1990 ACR+ | 3 (%13.6) | 0 (%0) | <0.001 |
| | 2010 ACR+ | 3 (%13.6) | 0 (%0) | |
| | Both of them+ | 16 (%72.7) | 0 (%0) | |
| | None | 0 (%0) | 85 (%100) | |

FMS: Fibromyalgia syndrome, VAS: Visual analog scale, BMI: Body mass index, FIQ: Fibromyalgia Impact Questionnaire, WPI: Widespread Pain Index, SS: Symptom Severity, BDI: Back Depression Inventory, BAI: Back Anxiety Inventory, ACR: American Collage of Rheumatology

**Table 3.** Correlations chest pain and clinical parameters in Group without fibromyalgia

| | Patient's pain assessment (0-100 mm VAS) | | Physician's pain assessment (0-100 mm VAS) | |
|---|---|---|---|---|
| | r | p | r | p |
| **Tender point count (0-18)** | 0.038 | 0.860 | -0.075 | 0.742 |
| **WPI** | -0.067 | 0.766 | -0.115 | 0.610 |
| **SS scale** | 0.557 | 0.007* | 0.394 | 0.069 |
| **FIQ** | 0.890 | 0.000* | 0.749 | 0.000* |
| **BAI (0-21)** | 0.417 | 0.054 | 0.447 | 0.037* |
| **BDI (0-21)** | 0.554 | 0.008* | 0.496 | 0.019* |
| **Pain duration (month)** | 0.235 | 0.293 | 0.057 | 0.800 |
| **Age (years)** | 0.128 | 0.569 | -0.161 | 0.473 |
| **Height (cm)** | 0.503 | 0.017* | 0.491 | 0.020* |
| **Weight (kg)** | -0.024 | 0.917 | 0.149 | 0.508 |
| **BMI (kg/cm2)** | -0.175 | 0.435 | -0.029 | 0.899 |

WPI: Widespread Pain Index, SS: Symptom Severity, FIQ: Fibromyalgia Impact Questionnaire, BAI: Back Anxiety Inventory, BDI: Back Depression Inventory, BMI: Body mass index

## Discussion

Reported first caserelated to FMS with no visceral origin of chest pain is a 52-year-old obese female. The patient had compression and chest pain on the left side of the chest and was followed up as myocardial infarction. However, it was determined later that this angina type pain in the patient was caused by spasm of the left-handed spinae and left trapezius muscle groups [14].

There are several studies reporting the prevalence of FMS in NCCP patients. In a study conducted by Wise et al. 100 NCCP reported a 5% prevalence of FMS in the patient [15]. Ho and colleagues examined whether the presence of FMS or chest wall sensitivity in patients with pre-coronary artery chest pain helped to distinguish between cardiac and NCCP. In conclusion, 19% of patients with normal coronary angiograms received FMS diagnosis according to ACR criteria but 3% of patients with abnormal angiogram had FMS diagnosis [16]. In our study, the prevalence of ACRs meeting the FMS classification criteria of 1990 was 3%, and the prevalence of ACRs meeting the 2010 FMS classification criteria was 3%. The ratio of those who met both the 1990 and 2010 criteria was 15%. It was seen that 79.4% of the patients did not meet any of the 1990 and 2010 FMS classification criteria for ACR.

In a study conducted by Öncü et al. 100 patients with widespread pain were included in the study. Sensitivity and specificity of ACR 2010 diagnostic criteria were found as 81% and 85% in3rd month and 88% and 86% respectively in 12th month. In this study, the sensitivity and specificity of the ACR 2010 diagnostic criteria at baseline and follow-up were high compared to the 1990 classification criteria, suggesting that the ACR 2010 diagnostic criteria should be chosen in clinical follow-up [17]. In our study, patients with NCCP had similar results with ACR 1990 and ACR 2010 diagnostic criteria. As far as we could investigate, we think that this is the first and only study to evaluate the ACR's1990 and 2010 FMS classification criteria in NCCP patients.

FMS is a syndrome characterized by widespread pain in the community with a prevalence of 1 to 5 percent. In all ethnic groups, 85-90% of patients can be seen in all ages and genders, and women are 40-60 years old. In our study, the FMS prevalence (3%) in patients with NCCP was found to be consistent with the general FMS prevalence (1-5%) in the population [18,19]. The mean age of NCCP patients included in this study is around 42 and this age group is within range.

In Kim et al.'s study, there was a positive correlation between the number of tender points and the WPI score and between the SS scale score and the FIQ score [20]. In the study performed by Segura-Jiménez et al. there was a positive correlation between the number of tender points and WPI score and SS scale score [21]. In our study, the number of tender points, WPI, SS and FIQ values of the other clinical and functional evaluation parameters of FMS were high in the FMS group, which was statistically significant. In addition, there was a positive correlation between the VAS pain scores evaluated by the physician and the BAI, BDI, duration of pain and height while there was a positive correlation between the VAS pain scores evaluated by the patient and SS scale, FIQ, BDI scores and height.

## Conclusion

The frequency of FMS in patients with NCCP is similar to the frequency of FMS in the general population. In patients with NCCP, FMS is a diagnosis that should be kept in mind. The criteria of ACR 1990 and 2010 are not superior to each other in the diagnosis of FMS in patients with NCCP. The application of both criteria in the FMS diagnosis place seems to be more advantageous in terms of not skipping FMS diagnosis. New studies are needed to determine the diagnostic criteria of FMS and its sensitivity and to revise existing diagnostic criteria. In these conditions the clinician's opinion is still important in the FMS definition.

## Limitation

This study has some limitations. First of all,the patients in the focus of the study consist of only female sex, for it is the profile of patients admitted to the cause of the outpatient clinic. It was observed that among the patients who applied to polyclinics, the number of women was much higher than that of men. Patient generalization with male FMS is not appropriate for the results obtained, but to be very dominant female gender in FMS makes these restrictions disregardable. Another limitation is the cross-sectional study of the work and a relatively low number of patients. However, to be wide of the exclusion criteria has caused the number of patients to be restricted.

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*The financial support for this study was provided by the investigators themselves.*

**Ethical approval**
*Before the study, permissions were obtained from local ethical committee.*

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## Referance

1. Wolfe F, Smyte HA, Yunus MB, et al. The American College of Rheumatology 1990 Criteria for the classification of fibromyalgia: report of the Multicenter Criteria Committee. Arthritis Rheum. 1990;33:160-72.
2. Yunus MB, İnanıcı F. Fibromyalgia syndrome: clinical features, diagnoses, and biopathophysiologic mechanisms. In: RachlinES, Rachlin IS eds, Myofascial Pain and Fibromyalgia. Trigger Point Management. Mosby, St Louis. 2002, pp. 3-31.
3. Yunus MB, Kalyan-Raman UP, Masi AT, et al. Electron microscopic studies of muscle biopsy in primary fibromyalgia syndrome; a controlled and blinded study. J Rheumatol. 1989;16:97-101.
4. Simms RW. Fibromyalgia is not a muscle disorder. Am J Sci. 1998;315:346-50.
5. Sprott H, Bradley LA, Oh SJ, et al. Immuno histochemical and molecular studies of serotonin, substance P, galanin, pituitary adenylyl cyclase-activating polypeptide and secretoneurin in fibromiyalgic muscle tissue. Arthritis Rheum. 1998;41:1689-94.
6. Şendur ÖF. Ağrılı Kas Sendromları. In: Oğuz H, Dursun E, Dursun N eds,Tıbbı Rehabilitasyon, Nobel Tıp Kitabevi, İstanbul, 2004;1221-38.
7. Çapacı K, Hepgüler S. Fibromiyalji Sendromu: Etiyopatogenez. Ege Fiz Tıp ve Reh Der 1998;4:219-225.
8. Ramos JA. The great deceiver: a case of central sensitization presenting as carcinoid syndrome. AA Case Rep. 2016;6:364-5.
9. Bradley LA, Alarcon GS. Fibromyalgia. In: Arthritis and Allied Conditions, Kopman WJed, Lippncott Williams&Wilkins, Philadelphia 2001:1812-44.
10. Sim J, Madden S. Illness experience in fibromyalgia syndrome: a metasynthesis of qualitative studies. Soc Sci Med. 2008;67:57-67.

11. Aaron LA, Burke MM, Buchwald D. Overlapping conditions among patients with chronic fatigue syndrome, fibromyalgia, and temporomandibular disorder. Arc Intern Med. 2000;160:221-7.

12. Aaron LA, Buchwald D. A review of the evidence for overlap among unexplained clinical conditions. Ann Intern Med. 2001;134:868-81.

13. Wolfe F, Clauw DJ, Fitzcharles MA, et al. The American college of rheumatology preliminary diagnostic criteria for fibromyalgia and measurement of symptom severity. Arthritis Care Res. 2010;62:600-10.

14. Patton IJ, Williamson JA. Fibrositis as a factor in the differential diagnosis of visceral pain. Can Med Assoc J 1948;58:162-6.

15. Wise CM, Semble EL, Dalton CB. Musculoskeletal chest wall syndromes inpatients with noncardiac chest pain: a study of 100 patients. Arch Phys Med Rehabil. 1992;73:147-9.

16. Ho M, Walker S, McGarry F, et al. Chest wall tenderness is unhelpful in the diagnosis of recurrent chest pain. QJM. 2001;94:267-70.

17. Oncu J, Iliser R, Kuran B. Do new diagnostic criteria for fibromyalgia provide treatment opportunity to those previously untreated? J Back Musculoskelet Rehabil. 2013;26:437-43.

18. Yunus MB, Masi AT. Juvenile primary fibromyalgia syndrome. Arthritis Rheum. 1985;28:139-44.

19. Yunus MB, Holt GS, Masi AT, et al. Fibromyalgia syndrome among the elderly: comparison with younger patients. J Am Geriatr Soc. 1988;32:987-95.

20. Kim SM, Lee SH, Kim HR. Korean J Pain. 2012;25:173-82.

21. Segura-Jiménez V, Aparicio VA, Álvarez-Gallardo IC, et al. Rheumatology Oxford. 2014;53:1803-11.