

# Comparison of Clinical and Psychologic Features of Fibromyalgia and Masticatory Myofascial Pain

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*The aim of this study was to investigate common symptoms and divergent features in fibromyalgia (FS) and masticatory myofascial pain (MFP) in patients affected by craniomandibular disorders. Twenty-three women with MFP and 23 women with FS were studied. All patients were examined by a dentist and by a rheumatologist. Craniomandibular disorders were assessed with a subjective symptoms questionnaire, detailed history interview, joint function examination, and manual palpation of masticatory and cervical muscles. The Middlesex Hospital Questionnaire was used to obtain personality profiles of the patients. The craniomandibular disorders questionnaire revealed various similarities in the two groups, the most striking of which were pain during mandibular function, articular noises, and headache. Both groups had muscle pain upon palpation; the mean scores (on a 0 to 4 scale) did not differ significantly between the two groups and ranged between 1.39 (SD 1.2) and 2.86 (SD 0.75). The mean value of active mouth opening was 40.9 mm (SD 9.1) in MFP patients and 44.6 mm (SD 7.2) in FS patients, while the mean value of passive opening was 49.6 mm (SD 6.0) in MFP patients and 49.8 mm (SD 3.5) in FS patients. These values did not differ significantly between the two groups, but did differ from the normal population, similar to the trend of the psychologic profile. The authors conclude that the physician should be alert to the need to conduct interdisciplinary evaluations in the diagnosis and management of FS and of MFP.*

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**key words:** craniomandibular disorders, chronic pain, fibromyalgia, myofascial pain syndrome

**M**yofascial pain (MFP) syndrome is frequently associated with general musculoskeletal complaints such as fibromyalgia,<sup>1-6</sup> while neck and shoulder symptoms are frequently seen in patients referred for mandibular dysfunction.<sup>7</sup> Patients with primary fibromyalgia may also suffer from mandibular dysfunction.<sup>1</sup> Myofascial pain syndrome has been defined as a musculoskeletal pain arising from one or several hyperirritable spots, called trigger points (TrPs).<sup>8-13</sup> Trigger points are found within hard, palpable bands of skeletal muscles and fascial structures of tendons and ligaments; palpation of TrPs results in a typical referred pain.<sup>12-14</sup> Patients with widespread musculoskeletal pain and fatigue were formerly diagnosed as having psychogenic rheumatism or a muscular rheumatism called "fibrositis" or "fibromyalgic syndrome" (FS).<sup>7,11,15-20</sup> This syndrome is characterized by tender points (TePs), specific areas of muscles, tendons,

and fat pads, that are much more tender to palpation than surrounding sites.<sup>21,22</sup> A TeP is also "a localized area of intense pain on deep palpation without referred pain."<sup>12p341</sup> Presumably, patients with FS are not immune to the development of TrPs,<sup>23</sup> and the question arises as to whether some TePs are in fact TrPs.<sup>3,8</sup>

The aim of this study was to investigate common symptoms and divergent features of the two disorders in a group of patients affected by craniomandibular disorders who had a diagnosis of MFP or FS.

## Materials and Methods

### Patients

Twenty-three women with a diagnosis of MFP (mean age 34 years; range 17 to 53), and 23 women with a diagnosis of FS (mean age 35.8 years; range 21 to 61) were studied. The patients came from the Department of Craniomandibular Disorders and the Department of Rheumatologic Diseases of the University of Naples "Federico II" over a 2-year period. All patients were examined by a dentist and by a rheumatologist.

### Dysfunctional Examination

In accordance with the American Academy of Orofacial Pain guidelines,<sup>24</sup> craniomandibular disorders were assessed by means of a subjective symptoms questionnaire, an interview to elicit a detailed medical history, and a clinical examination. The questionnaire contained the following items: earache, pain during mandibular function, temporomandibular joint (TMJ) noise, impaired mandibular movements, locking, headache, sleep quality, body pain, and influence of these symptoms on the patient's everyday life. To obtain a detailed history, each patient was questioned about serious past complaints and about their present illness (date of onset and triggering event; location of signs and symptoms; types, intensity, duration, and frequency of signs and symptoms; remission or change over time; modifying factors; previous treatment including surgery and its outcome; trauma; medications; allergies; and alcohol and other substances of abuse). Patients were questioned regarding their dental history: present or past relevant physical disorders or disease; previous treatment; and diurnal and nocturnal parafunctional history.

The clinical examination consisted of the evaluation of the masticatory muscles, the TMJs, and the

range of mandibular movement. Bilateral manual palpation of masticatory muscles (temporal and its attachment, deep and superficial masseter, and medial pterygoid) and cervical muscles (neck, sternocleidomastoid region, and shoulder) was performed and pain was graded as follows: 0 = no pain; 1 = complaint of pain without grimace or flinch; 2 = pain plus grimace or flinch; 3 = pain plus marked flinch or palpebral reflex; 4 = guarded reflex, subject "untouchable."<sup>14</sup> Manual palpation is the technique most widely used to assess muscle pain.<sup>25</sup> Bilateral manual palpation of the TMJ was performed to assess movement patterns, tenderness, pain, and swelling. Palpation was performed directly over the lateral pole of the condyle (preauricular) as well as posteriorly through the external auditory canals (intrameatally). Auscultation with finger tips and palpation for joint noises during all movements were also performed. Mouth opening and lateral movements of the mandible were recorded as follows: maximum comfortable opening, full unassisted opening, and assisted opening (ie, the active and passive range of motion that reveals the joint endfeel).

### Myofascial Pain Diagnosis

The criteria for a diagnosis of MFP were: (a) masticatory muscle pain of more than 3 months' duration<sup>11,12,14</sup>; (b) increased muscle pain during function and palpation<sup>13</sup>; (c) presence of one or more TrPs,<sup>10,11,13,14,25,26</sup> sometimes accompanied by a palpable abnormality in muscle consistency, ie, the taut band<sup>10</sup>; (d) presence of referred pain, ie, a distant area of perceived pain referred by an irritable TrP,<sup>10,13,14</sup> which is considered a consistent feature of a TrP<sup>11</sup>; (e) no joint pain on palpation (patients with joint noise that did not require treatment were also included in the sample<sup>17</sup>); and (f) unassisted mouth opening less than 35 mm with positive endfeel.<sup>24</sup>

### Rheumatologic Examination

The rheumatologic examination consisted of a questionnaire, a clinical examination, and routine blood tests. The Campbell questionnaire<sup>27</sup> assesses the chronicity of the pain, patient fatigue, quality of sleep, and influence of heat and/or cold on the symptomatology. During the clinical examination, the physician looked for TePs at 18 paired sites all over the body (Fig 1). Laboratory blood tests were performed in all patients. All patients were examined by a rheumatologist, who excluded rheumatic diseases other than FS.





Fig 1 Tender points examined by the rheumatologist (18 paired sites). (Illustration reproduced with permission from Fricton and Awad.<sup>36</sup>)

### Fibromyalgia Diagnosis

Fibromyalgia was diagnosed according to the criteria recommended by the American College of Rheumatology<sup>28</sup>: (a) history of widespread musculoskeletal pain of more than 3 months' duration<sup>12,28</sup>; (b) pain in 11/18 TeP sites on digital palpation exerted with a pressure of about 4 kg. A TeP is diagnosed if the subject states that palpation is painful<sup>28</sup>; (c) normal laboratory blood tests; and (d) absence of other rheumatologic disorders.

### Middlesex Hospital Questionnaire Psychological Test

The Middlesex Hospital Questionnaire (MHQ) psychological test was administered to all patients.<sup>29,32</sup> This test assesses six behavioral attitudes: anxiety, phobia, obsession, somatization, depression, and hysteria.

### Statistical Analysis

The chi-square test with Yates's correction and Fisher's Exact test were used to analyze the results of questionnaires because the total number of 46 units and the frequency of some cells were very

Table 1 Results of Subjective Symptoms Questionnaire Administered to MFP and FS Patients

Symptom	MFP (%)	FS (%)	P
Tooth pain	54	43	NS <sup>†</sup>
Pain around the ear	92	82	NS <sup>*</sup>
Pain during mandibular function	75	74	NS <sup>*</sup>
Articular noises	67	69	NS <sup>†</sup>
Difficulty on mouth opening	79	48	NS <sup>†</sup>
Difficulty on jaw movements	58	43	NS <sup>*</sup>
Subluxation	17	0	NS <sup>*</sup>
Chewing on one side	71	65	NS <sup>†</sup>
Headache	92	91	NS <sup>*</sup>
Pain in shoulders, neck, face	79	87	NS <sup>*</sup>
Pain in other parts of the body	27	100	<.001
Jaw stiffness in the morning	67	48	NS <sup>†</sup>
Bruxism and/or grinding	50	65	NS <sup>†</sup>
Effect of pain on private life	83	74	NS <sup>†</sup>
Sleep disturbance	58	74	NS <sup>†</sup>

<sup>†</sup>Chi-square test with Yates' correction.

<sup>\*</sup>Fisher's Exact test.

NS = not significant.

low. The chi-square test was also used to compare the data concerning the onset of the disorders and the presence of articular noises. Means, standard deviations, and Wilcoxon's rank sum test were used to analyze muscle pain scores. Student's *t* test (mean values and standard deviations) was used to compare the results of the MHQ and mouth opening among MFP patients, FS patients, and the normal population.<sup>32,33</sup>

### Results

The two groups of patients gave similar answers to the subjective symptoms questionnaire (Table 1); the similarity was particularly striking for pain during mandibular function, articular noises, and headache. In contrast, body pain was present in all FS patients, but in only 27% of the MFP group ( $P = .0001$ ). Symptoms appeared in MFP patients 3.4 years (SD 3.6) before our study, versus 6 years (SD 5.3) in FS patients. A tragic event (eg, death of a relative or a divorce) or stress coincided with the onset of the pain in 50% of MFP patients and in 13% of FS patients ( $P = .0007$ ). Clinical examination of the TMJ revealed no pain on palpation.

**Table 2** Muscle Pain in MFP and FS Patients (Scale = 0–4)

Muscles	MFP mean (SD)	FS mean (SD)	W	P
<b>Temporalis muscle</b>				
Posterior part, right	1.39 (1.20)	1.82 (.98)	606.5	NS
Posterior part, left	1.95 (1.12)	1.73 (1.09)	505.5	NS
Medial part, right	1.79 (1.14)	2.30 (1.06)	609.5	NS
Medial part, left	2.00 (1.21)	2.39 (1.11)	591.5	NS
Anterior part, right	2.08 (1.38)	2.56 (1.03)	604.0	NS
Anterior part, left	2.41 (1.38)	2.56 (1.23)	564.0	NS
Attachment, right	2.04 (1.33)	2.26 (.75)	578.0	NS
Attachment, left	2.62 (1.24)	2.08 (.79)	453.0	< .05
<b>Masseter muscle</b>				
Superficial, right	2.45 (1.25)	2.73 (.96)	361.0	NS
Superficial, left	2.79 (1.25)	2.86 (.75)	527.0	NS
Deep, right	2.20 (1.25)	2.26 (.86)	530.0	NS
Deep, left	2.12 (1.29)	2.34 (1.11)	559.5	NS
<b>Medial Pterygoid muscle</b>				
Right	1.83 (1.23)	2.47 (1.23)	620.0	NS
Left	2.29 (1.23)	2.47 (1.03)	551.5	NS
<b>Sternocleidomastoid muscle</b>				
Right	2.16 (1.09)	2.47 (1.23)	608.0	NS
Left	2.54 (0.97)	2.26 (1.28)	522.0	NS
<b>Neck</b>				
Right	1.5 (1.35)	1.60 (1.52)	551.5	NS
Left	1.5 (1.41)	1.69 (1.57)	561.0	NS
<b>Shoulder</b>				
Right	1.75 (1.29)	2.34 (1.15)	603.0	NS
Left	1.62 (1.34)	2.17 (1.30)	599.5	NS

W = Wilcoxon's rank sum test.  
NS = not significant.

**Table 3** Active and Passive Mouth Opening for MFP and FS Patient Versus Normal Population

	MFP (N = 23) mean (SD)	FS (N = 23) mean (SD)	P	NP*	P (MFP vs NP)	P (FS vs NP)
Active opening (mm)	40.9 (9.1)	44.6 (7.2)	NS	51.5 (8.3)	< .001	< .001
Passive opening (mm)	49.6 (6.0)	49.8 (3.5)	NS	54.4 (7.6)	< .001	< .01

\*NP = normal population as reported by Lobbezoo-Scholte et al.<sup>13</sup> Normal population for active opening = 144 subjects; for passive opening = 108 subjects.  
NS = not significant.

**Table 4** Psychologic Profiles for MFP and FS Patients Versus Normal Population

Behavior	MFP mean (SD)	FS mean (SD)	P	NP*	P (MFP vs NP)	P (FS vs NP)
Anxiety	7.8 (4.2)	10 (4.5)	NS	6.4 (3.4)	< .05	< .001
Phobia	5.7 (3.3)	6.7 (3.4)	NS	5.1 (2.7)	NS	< .05
Obsession	6.5 (3.7)	8.3 (4.1)	NS	6.2 (3.3)	NS	< .05
Somatization	7.8 (3.9)	8.7 (2.7)	NS	4.6 (3.1)	< .001	< .001
Depression	6.9 (2.9)	8.6 (3.6)	NS	5.2 (2.9)	< .01	< .001
Hysteria	5.6 (3.1)	6.6 (3.4)	NS	5.6 (3.1)	NS	NS

\*NP = normal population as reported by Zizolfi et al<sup>12</sup> (156 subjects).  
NS = not significant.



Temporomandibular joint noises were detected in 26.5% of MFP patients and in 17.8% of FS patients ( $P = .72$ ). Muscle palpation was positive for both groups (Table 2), and there was no statistical difference in muscle pain levels between the two groups (except for the left temporal insertion:  $P = .04$ ). Referred pain, which was an inclusion criteria for MFP patients, was also present in 13% of FS patients. There was no difference in the range of active and passive mouth opening between the two groups of patients, but it was lower than in the normal population described by Lobbezoo-Scholte et al<sup>33</sup> (Table 3). Similarly, as shown in Table 4, there was no difference in the mean psychologic scores of FS and MFP patients, but their scores were significantly higher than those obtained in the normal population as reported by Zizolfi et al.<sup>32</sup>

## Discussion

Results of questionnaires must be interpreted with caution, because they are often at variance with clinical findings.<sup>24</sup> However, our results about body pain, which differed significantly between the two groups, reflect the widespread pain typical of FS.<sup>14,26,28</sup> On the whole, our findings coincide with the report by Fricton and Sheldon,<sup>34</sup> who concluded that many of the clinical characteristics of FS, eg, fatigue, morning stiffness, and sleep disorders, can also accompany MFP.

The discrepancy between TMJ noises reported by our patients and those recorded by the physician during the clinical examination can be the result of the sporadic nature of these noises, ie, they did not occur during the clinical examination although the patient had suffered from TMJ noises.

Muscle palpation did not reveal any major differences between the two groups; in fact, a difference was found in only 1 muscle out of the 20 examined. The results of active and passive mouth opening and the psychologic profile results were also similar in our two groups of patients. Consequently, these parameters do not distinguish between the two disorders.

There is some debate as to whether TrPs and TePs represent the same physical abnormality.<sup>12</sup> It has been suggested that the tenderness of a TeP could represent referred tenderness when the tender point lies in the zone to which a distant trigger point refers pain.<sup>5</sup> Therefore, because the diagnostic criteria for MFP and FS are based on the presence of TrPs and TePs, which are still not clearly defined, a measure of caution should be applied in

interpreting the results of studies aimed at distinguishing these two disorders.

Some patients with FS are frequently found to have "painful TrPs" in the trapezius, levator scapulae, and other girdle muscles.<sup>20</sup> In our sample, 13% of FS patients also had TrPs with referred pain in the craniomandibular area. However, the relevance of this finding is difficult to ascertain also because, as far as we are aware, there are no data about the frequency of TrPs in this area of the body.

It has been suggested that FS and MFP might be different manifestations of the same condition<sup>4</sup> and that these disorders may represent two extremes of a continuous spectrum with the same underlying pathophysiology.<sup>34</sup> Other authors<sup>9</sup> differentiate these two syndromes for a variety of reasons: (a) MFP is primarily a dysfunction of one or more specific muscles, while FS is fundamentally a systemic disease; (b) patients with MFP have TrPs, while patients with FS have TePs; (c) MFP typically begins with an acute muscle strain or chronic overuse of a specific group of muscles, while FS usually begins insidiously and the patient complains of generalized pain and often of muscle fatigue; (d) weakness in patients with MFP is limited to the specific muscles that have TrPs, while it is widespread in FS; (e) pain in MFP may be traced to myofascial TrPs in specific muscles, while the origin of pain in FS is not identifiable; (f) the TrPs of MFP respond to specific treatment directed to that muscle, while FS is treated with systemic medication.<sup>9</sup>

## Conclusion

Opinions still differ as to the association between MFP and FS. A correlation may be overlooked because a rheumatologist examining a patient with suspected FS looks for tenderness in 11/18 anatomic sites all over the body, but not in the craniomandibular area.<sup>35</sup> Similarly, when examining a patient with a craniomandibular disorder and suspected MFP, the physician analyzes TrPs in the craniomandibular area but not in other muscles of the body. Consequently, it seems advisable that the rheumatologic examination of patients affected by FS include the search for TePs and TrPs in the craniomandibular area.

Since we found that many patients with FS suffer from symptoms typical of MFP and vice versa, an interdisciplinary approach (dentistry, neurology, rheumatology, and psychology) to these patients may help to clarify the origin of the "pain."



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## Resumen

Comparación de los rasgos clínicos y psicológicos de la fibromialgia y el dolor miofascial masticatorio

El propósito de este estudio fue el de investigar los síntomas comunes y los rasgos divergentes en pacientes con fibromialgias y dolor miofascial masticatorio (DMM) afectados por desórdenes craneomandibulares (DCM). Se estudiaron 23 mujeres con DMM y 23 mujeres con fibromialgias. Todos las pacientes fueron examinadas por un odontólogo y un reumatólogo. Los DCM fueron evaluados por medio de un cuestionario de síntomas subjetivos, una entrevista que incluía la historia detallada, un examen de la función de la articulación, y una palpación manual de los músculos masticatorios y cervicales. Se utilizó el Cuestionario Hospitalario de Middlesex para obtener los perfiles de la personalidad de los pacientes. El cuestionario de desórdenes craneomandibulares reveló varias similitudes en los dos grupos, siendo la más impresionante la relacionada con el dolor durante la función mandibular, los sonidos articulares y el dolor de cabeza. Ambos grupos tenían dolor muscular a la palpación; la puntuaciones medias (en una escala de 0 a 4) no se diferenciaron significativamente entre los dos grupos y variaron entre 1.39 (Desviación Estándar [DE] 1.2) y 2.86 (DE 0.75). El valor medio de la apertura bucal activa fue de 40.9 mm (DE 9.1) en las pacientes con DMM y de 44.6 mm (DE 7.2) en las pacientes con fibromialgia, mientras que el valor medio de la apertura pasiva fue de 49.6 mm (DE 6.0) en las pacientes con DMM y de 49.8 mm (DE 3.5) en las pacientes con fibromialgia. Estos valores no se diferenciaron significativamente entre los dos grupos, pero se diferenciaron de la población normal, lo cual fue parecido a la dirección tomada por el perfil psicológico. Los autores concluyen que el médico debe estar alerta a la necesidad de conducir evaluaciones interdisciplinarias en el diagnóstico y manejo de la fibromialgia y el DMM.

## Zusammenfassung

Vergleich von klinischen und psychologischen Symptome und Abweichungen bei Fibromyalgie und myofaszialem Schmerz der Kaumuskulatur

Ziel dieser Untersuchung war, gemeinsame Symptome und Abweichungen bei FS und MFP bei Patienten mit Craniomandibularstörungen zu bewerten. 23 Frauen mit FS und 23 Frauen mit MFP wurden untersucht. Alle Patienten wurden von einem Zahnarzt und einem Rheumatologen untersucht. Craniomandibularstörungen wurden mit einem subjektiven Symptom-Fragebogen, einem ausführlichen Gespräch über den Krankheitsverlauf, Untersuchung der Gelenkfunktion und manuelle Untersuchung der Kau- und Gesichtsmuskeln ermittelt. Persönlichkeitsprofile wurden mit Hilfe des Middlesex Hospital-Fragebogens erstellt. Der Fragebogen zu Craniomandibularstörungen ergab eine Reihe von Ähnlichkeiten zwischen den beiden Gruppen und darunter Schmerz bei mandibularen Funktionen, Gelenkgeräusche und Kopfschmerz. Beide Gruppen hatten Muskelschmerzen bei der Palpation; die Durchschnittswertung der schmerzschwelle der beiden Gruppen wies keine wesentlichen Unterschiede auf, und lag zwischen 1.39 (SD1.2) und 2.86 (SD.75). Der Durchschnittswert bei aktiver Mundöffnung lag bei 40.9mm (SD9.1) bei MFP Patienten und 44.6mm (SD7.2) bei FS Patienten; der Durchschnittswert bei passiver Öffnung lag bei 49.6mm (SD6.0) bei MFP und 49.8mm (SD3.5) bei FS Patienten. Diese Werte unterschieden sich zwar kaum zwischen beiden Gruppen, weisen aber Unterschiede zur gesunden Bevölkerung und dasselbe gilt für das psychologische Profil. Der Arzt sollte deshalb die Notwendigkeit einer interdisziplinären Auswertung in der Diagnose und Behandlung von FS und MFP berücksichtigen.

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