

Symptoms and signs of mandibular dysfunction in primary fibromyalgia syndrome (PSF) patients

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ABSTRACT

Primary fibromyalgia syndrome (PFS) is a form of nonarticular rheumatism characterized by muscular pain and stiffness, commonly located in the neck-, shoulder-, back-, and pelvic regions. The most common finding in patients with mandibular dysfunction (MD) is pain or tenderness of the masticatory muscles, but tender and painful neck and shoulder muscles are also often found in relation to jaw muscle affection. Complaints presented by patients suffering from musculoskeletal conditions may overlap one another. Indeed, there may be some common causative factors for these complaints.

To test the hypothesis that some complaints by PFS patients could be explained by mandibular dysfunction, we have investigated the subjective symptoms and the clinical state of the stomatognathic system in eight patients suffering from PFS. According to the Helkimo anamnestic dysfunction index, six patients were classified as having severe signs of MD. The Helkimo clinical dysfunction index revealed severe or moderate dysfunction in all patients. Recurrent headaches was reported by half of the patients.

In conclusion, the present study shows that PFS patients also may suffer from mandibular dysfunction. Thus, an examination of the function of the stomatognathic system would be an important part in the investigation to elucidate possible etiological factors behind the reported complaints by PFS patients. PFS may also be of etiological importance for mandibular dysfunction.

SAMMANFATTNING

Primär fibromyalgi (PF) definieras som en form av reumatism utan ledengagemang och karakteriseras av muskelsmärter och stelhet i framför allt hals-, skuldra-, rygg- och bäckenregionerna. Patienter med mandibulär dysfunktion, hos vilka det vanligaste fyndet är smärta och/eller ömhet i käkmuskulerna, uppvisar också ofta smärta och ömhet i nack-hals- och skuldra-muskulaturen.

Symptom från olika muskulära åkommor kan tänkas dels överlappa varandra dels ha gemensamma orsaksfaktorer. För att pröva hypotesen att mandibulär dysfunktion skulle kunna vara en orsaksfaktor bakom PF-patienternas symptom i huvud-hals regionen har vi undersökt käk-

funktionen hos åtta kvinnliga patienter med primär fibromyalgi. Mätt med Helkimos dysfunktionindex hade sex av patienterna uttalade subjektiva dysfunktionssymptom medan samtliga uppvisade uttalade eller måttliga kliniska tecken på mandibulär dysfunktion. Hälften av patienterna besvärades av huvudvärk.

Vår undersökning visar således att patienter med primär fibromyalgi också kan ha uttalade symptom på mandibulär dysfunktion. Klinisk undersökning av käkfunktionen hos dessa patienter bör därför vara ett viktigt komplement för att klarlägga orsaken bakom patienternas besvär. Primär fibromyalgi kan även tänkas utgöra en etiologisk faktor vid mandibulär dysfunktion.

INTRODUCTION

Primary fibromyalgia syndrome (PFS) is a form of nonarticular rheumatism characterized by muscular pain and stiffness, commonly located in the neck, shoulder, back, and pelvic regions. Frequently there are also multiple tender points and/or trigger points (i.e. tender point causing referred pain upon palpation) at specific anatomical sites (*Yunus et al.* 1981). Associated symptoms such as hearing and vestibular abnormalities, sleep disturbances and morning fatigue have also been reported (*Moldofsky et al.* 1975, *Sharav et al.* 1978, *Gerster & Hadji-Djilani* 1984). The syndrome is considered primary when there is no known underlying cause or associated disorder.

Symptoms and signs of functional disorders of the stomatognathic system (i.e. mandibular dysfunction) have been found in a large portion of the population (*Helkimo* 1979) and the most common finding reported in patients, as well as in population studies, is pain or tenderness to palpation of the masticatory muscles. Moreover, tender and painful neck and shoulder muscles are also often found in relation to jaw muscle affection (*Gelb & Tärte* 1975, *Heiberg, Helöe & Krogstad* 1978, *Lous & Olesen* 1982, *Alanen & Kirveskari* 1982, 1985).

Complaints presented by patients suffering from different musculoskeletal conditions may overlap one another. Indeed, there may be common causative factors for these complaints. These possibilities must be considered so that the treatment of choice is based on causative factors rather than on secondary symptoms.

To test the hypothesis that some complaints by PFS patients could be explained by mandibular dysfunction we have evaluated the subjective symptoms and the clinical state of the stomatognathic system in a group of patients suffering from the primary fibromyalgia syndrome.

SUBJECTS AND METHODS

Eight PFS patients at the department of Rheumatology, University hospital, Linköping, all females aged 30–55 years (mean age 43), were examined. They fulfilled the diagnostic criteria proposed by *Yunus et al.* (1981) and had chronic generalized muscular aches, pains and prominent stiffness. On average the patients had had these symptoms for 8 years (range 1–27). All had more than 10 tender or trigger points (outside the cranio-mandibular area). The PFS symptoms were modulated by physical activity, anxiety, stress and weather factors. Common complaints were also poor sleep, general fatigue and swelling and numbness of the hands. Clinical and laboratory examinations did not reveal the presence of any rheumatological or neuromuscular disorder, other than PFS. Routine laboratory tests (erythrocyte sedimentation rate, blood count, electrolytes, creatine, alanine-amino transferase, aspartate-aminotransferase, creatine kinase, thyroid function and rheumatoid factor) were normal in all patients. The patients were being treated with non-steroidal, antiinflammatory drugs or mild tranquilizers.

Anamnestic data concerning symptoms of dysfunction of the stomatognathic system and the neck and shoulders, otological, oral and throat sensations, oral parafunctions and recurrent headaches were obtained using a questionnaire.

The clinical examination comprised mandibular mobility, occlusion state (number of teeth, tooth wear, unilateral tooth contact in the retruded contact position, RP, and on the mediotrusion side, anterior and lateral slide ≥ 0.5 millimeters between RP and the intercuspal position, IP), function of the temporomandibular joint (TMJ) (joint sounds, locking or luxation, deviation ≥ 2 millimeters of the mandible during mouth opening), painful mandibular movement, bilateral tenderness or pain to palpation of the TMJ (laterally and posteriorly via the auditory meatus), the mandibular muscles (the deep masseter and the origin, belly and insertion of the superficial masseter, the anterior and posterior portions of the superficial temporal muscle, the insertion of the deep temporal muscle, the insertion of the medial pterygoid, the lateral pterygoid the posterior digastric muscle, the anterior digastric and the mylohyoid, the buccinator), and the sternocleidomastoid (origin, insertion and belly), the neck (insertion, middle portion) and shoulder muscles. A total of 12 bilateral areas in the mandibular muscles and 6 bilateral areas in the neck and shoulder muscles were examined. The degree of tooth wear was assessed both by clinical and cast evaluation. The intraoral tissues were examined for mucosal ridgings and teeth impressions on the tongue. The examiner (P-O E) was unaware of the result of the questionnaire. Tenderness or pain to palpation and pain on mandibular movement were recorded if a palpebral (grade 2) or guarded (grade 3) reflex was elected. Additional anamnestic data were collected after the clinical examination. The subjective symptoms and clinical signs were quantified by the anamnestic (Ai) and clinical (Di) dysfunction indices as devised by *Helkimo* (1974). In calculation of the

clinical dysfunction index, only the seven bilateral jaw muscle areas proposed by *Helkimo* (1974) were included. The occlusion was classified according to the Eichner index (*Eichner* 1955). In addition, a cariologic and periodontal examination was performed.

RESULTS

The prevalence and location of subjective head and neck pain reported by each patient are given in Fig. 1 and Table I. According to the anamnestic dysfunction index, 6 of 8 patients were classified as having severe (AiIII) signs of mandibular dysfunction. Five patients complained of facial pain. Seven were aware of some oral parafunctions. Three had a feeling of globus in the throat or diverging taste and two complained of dryness in the mouth (in one case probably due to medication). All patients had one or more otological symptom (mostly vertigo). Four had recurrent headaches (three times a month or more) and all suffered from neck pain. The sinus maxillary symptoms were pain (subjects C and F) and discomfort (subject B).

The results of the clinical examination are shown in Fig. 2 and Table 2. The average maximal mandibular movements were: mouth opening 46 mm (SD 5.8, range 37–55), laterotrusion left 9.8 mm (SD 2.9, range 5–14) and right 10 mm (SD 2.3, range 5–12), and protrusion 8 mm (SD 4.2, range 4–11). According to the clinical dysfunction index, signs of mandibular dysfunction were detected in all patients, four had severe (DiIII) and four moderate (DiII) signs. All subjects were bilaterally tender to palpation in the lateral pterygoid muscle. Trigger points in the jaw muscles were found in three patients (A, C, H). Two subjects (B, E) were tender to palpation in the buccinator muscle. One of these (E) was also aware of tongue parafunction and complained of globus and discomfort in the throat. This patient could provoke neck and forehead pain by pressing her tongue against the palate and the frontal teeth. All subjects were tender to

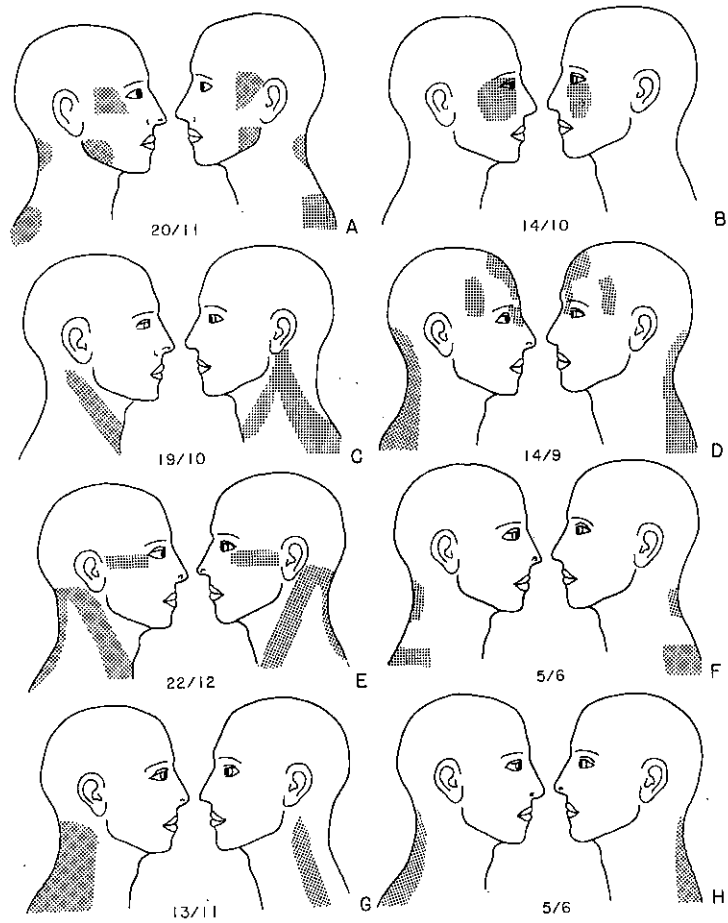


Fig. 1. Distribution of pain in the head and neck drawn by each patient on figures in the questionnaire prior to the clinical examination. The total number of areas tender to palpation in jaw/neck muscles are given.

palpation of the neck and shoulder muscles, and six in the TMJ. Clicking was recorded in four patients, deviation in two, unilateral contact in the RP in four and anterior slide 0.5 mm between RP and IP in one (C). Nonfunctional wear facets, beyond the normal range of masticatory movements, were seen on the incisal edge of the incisors and/or the canines in six subjects. None showed general extensive occlusal or incisal wear. According to the

Eichner index, three patients could be classified as A₁, another three as B₁, and one as B₂. Five patients (A, B, D, F, H) had crowns and/or fixed bridges and one (E) had complete upper and lower dentures. Seven patients had an average of 39 (range 28–58) surfaces restored with dental amalgam and five of these also had an average of 13 white fillings. Dental caries and signs of periodontal disease were very low frequent.

Table 1. Subjective symptoms.

Subject No	A _i	Tiredness/stiffness in jaws	Pain ^(*) in face/jaws	Pair ^(*) full jaw movement	TMJ ^(*) sounds	Diffic ^(*) culties in mouth opening	Oral parafunctions			Globose in the throat	Taste sensation	Sinus	Otolological		Recurrent headaches	Neck pain	
							Clenching grinding	Tongue pressing	Others				Tinnitus	Stiffness			Vertigo
A	II	+	+	+	+		+		+				+		+		
B	II		+								+					+	
C	II		+								+					+	
D	II		+						+							+	
E	II	+						+								+	
F	II			+							+					+	
G	0												+			+	
H	0															+	

^(*) included in A_i

Table 2. Clinical findings

Subject No	D _i	Number of sites tender to muscle palpation		Painful jaw movement	TMJ Clicking	Palpation tenderness		Max jaw opening capacity	Deviations	Unilateral contact in RP	Non functional wear facets	Number of teeth	Eicher index
		Jaw	Neck			Lat palp	Post palp						
A	III	20	11			+	+	45		+	+	21	B ₂
B	III	14	10	+	+	+	+	37		+	+	28	A ₁
C	III	19	10	+		+	+	44		+	+	28	A ₁
D	III	14	9	+		+	+	55		+		31	A ₁
E	II	22	12	+		+		53	+		+	^(*)	
F	II	5	6	+	+			43			+	23	B ₁
G	II	13	11	+	+			47	+		+	25	B ₁
H	II	5	6	+	+			43			+	22	B ₁

^(*) complete dentures

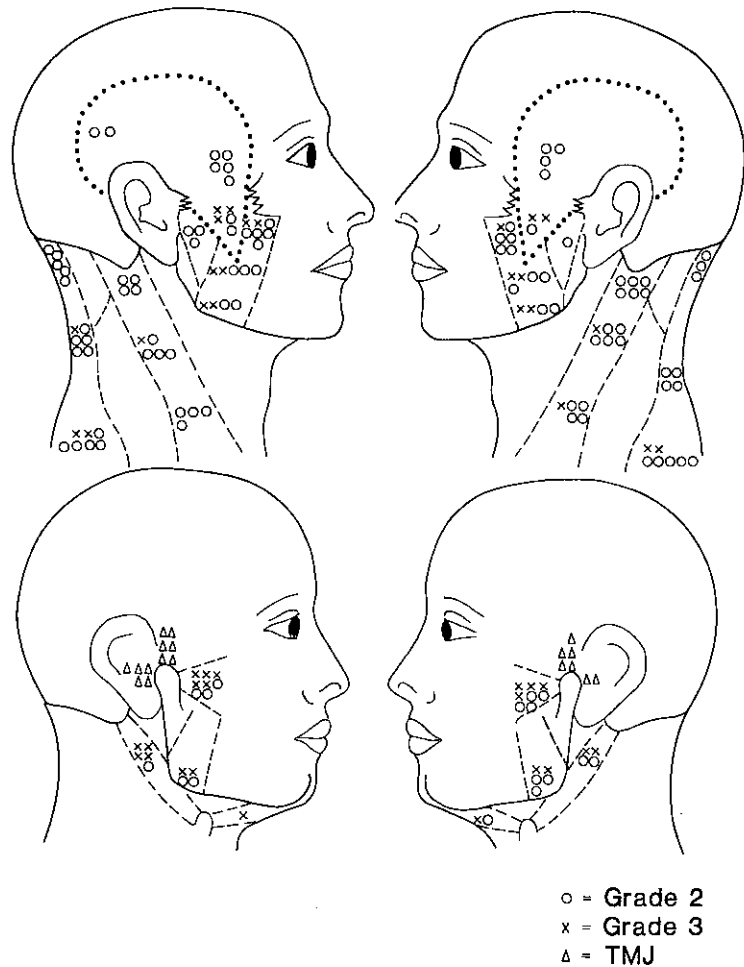


Fig. 2. Distribution of palpatory pain or tenderness in the left and right side jaw and neck muscles and temporomandibular joint. The results from all patients have been pooled. Each marking (unfilled circle, cross or triangle) represents one subject. Only pain that produced a palpebral reflex or guarding reaction is marked in the figure.

DISCUSSION

This study shows that patients suffering from PFS also may have symptoms and signs of dysfunction of the masticatory system. Six of eight patients were found to have severe symptoms of mandibular dysfunction, according to the anamnestic dysfunction index proposed by *Helkimo* (1974). According to the clinical dysfunction index, all patients had severe or moderate dysfunction.

Palpatory tenderness was recorded in the jaw muscles of all patients. Furthermore, all subjects met the criteria for the maximal number of points for muscle tenderness in the dysfunction index (*Helkimo* 1974), i.e., more than three areas tender to palpation. As would be expected from the PFS diagnosis, all patients were tender to palpation in the neck muscles. In order to give an extended description of the prevalence of muscle tenderness in

the head and neck region, we have in this study reported the total number of tender areas found in each patient. The wide interindividual variation that we found may reflect variation in etiology and pathophysiology behind these observations. It may also be related to individual differences in severity of the disease. Another factor which may be of both etiologic and therapeutic importance is whether tenderness or pain upon palpation is localized in tendinous areas or in the belly of the muscle, e.g. related to distribution of pain nerve fibres. In this study, we have not evaluated our findings with regard to such tissue origin. However such a distinction may be of significant importance, e.g. to further elucidate the pathophysiology and in planning and interpreting electromyographic studies of jaw muscle pain.

Muscle tenderness may be related to jaw muscle hyperactivity resulting from continuous low- and high-level strain during normal functions, as well as in oral parafunctions. Parafunctional activity was reported by seven patients, and wear facets on the incisal edges of incisors and canines, reflecting grinding beyond the functional range, were found in six patients. Furthermore, in the patient with complete dentures, symptoms of pain in the neck and forehead could be provoked by voluntary tongue pressing.

Tender jaw muscles may also be a secondary effect of disturbed muscle metabolism or function, causing the muscles to be generally more susceptible or vulnerable than in normals. This hypothesis is supported by findings of reduced high energy phosphate levels and low or abnormal muscle oxygenation in patients with PFS (*Bengtsson 1986, Bengtsson et al. 1986, Lund et al. 1986*). Thus, PFS may also very well be of etiological importance for mandibular dysfunction. There is also the possibility that secondary jaw muscle hyperactivity resulting in pain is related to physical and/or psychic tension, which are referred to severe PFS-symptoms.

The great potential socio-economic importance of stomatognathic disorders has recently been shown in a series of interesting studies (*Alanen & Kirveskari 1982, 1983, Kirveskari & Alanen 1984*). They investigated shipyard workers and found an association between head and neck problems, diagnosed by physicians, and clinical signs of mandibular dysfunction. Workers with mandibular dysfunction had more days on sick leave than those without dysfunction. The authors could also show that treatment for mandibular dysfunction was followed by a significant reduction of sick leave. *Alanen & Kirveskari (1985)* hypothesized that dysfunction of the stomatognathic system may predispose a subject to cervicobrachial disorders.

Recurrent headaches was reported by four of the eight patients. A number of clinical studies have shown a correlation between mandibular dysfunction and recurrent headaches, and that subsequent stomatognathic treatment resulted in a decrease in headache (e.g. *Berlin et al. 1954, Gelb & Tarte 1975, Magnusson & Carlsson 1980, 1983, Forsell 1985*). Thus, the symptom of headache seems to be another criteria to justify examination of the masticatory system of the PFS-patients.

All patients reported at least one otological symptom or oral symptom such as globus in the throat or taste sensation. Such symptoms seem to be common for a variety of clinical conditions or "syndromes" (Table 3). One explanation may be that investigators of different professional backgrounds may be dealing with different branches of the same tree. Openminded collaboration between different fields should therefore improve diagnostics and therapy.

In conclusion, the present study shows that PFS patients also may suffer from mandibular dysfunction. Thus, an evaluation of the function of the stomatognathic system would be an important part in the examination to elucidate possible etiological factors behind the complaints in the cranio-facial and neck regions of PFS patients.

Table 3. Complaints reported by patients suffering from primary fibromyalgia syndrome (PFS), temporomandibular joint dysfunction syndrome (TMJ), Costen syndrome (COS), oral galvanism (OG), cervical syndrome (CS) and Meniere's disease (morbus Menière, MbM).

	Pain			Pain/Tenderness/Stiffness			Otological Symptoms					Oral Symptoms				
	Head/Face Jaws	Neck/ Shoulders	Head ache	Limbs	Back	Stiff- ness	Tinni- tus	Ver- tigo	Impaired hearing	Pain in/ around ear	Pain in the sinus area	Burning sensation	Dry- ness	Globus in the throat		
PFS ¹⁾	+	+	+	+	+	+	+	+					+	+		
PFS ²⁾		+	+	+	+		+	+					+	+		
TMJ ³⁾	+	+	+	+	+		+	+	+		+	+	+			
COS ⁴⁾	+	+	+	+	+		+	+	+		+	+	+			
OG ⁵⁾	+	+	+	+	+		+	+	+		+	+	+			
CS ⁶⁾						+	+	+	+							
MbM ⁶⁾							+	+	+							

1) Present investigation

2) Yunus et al. 1981, Bengtsson 1986

3) Eggen 1954, Sharaw et al. 1978, Koskinen et al. 1980, Moss and Garrett 1984

4) Costen 1934, 1944

5) Axell et al. 1983, Haraldsson 1985, Jontell et al. 1985, Hugoson 1986, Agerberg 1987

6) Myrhaug 1981

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