

Chronic myofascial pain, disk displacement with reduction and psychosocial factors in Finnish non-patients

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This study aimed to determine chronic groups of myofascial pain and chronic disk displacement with reduction over a 1-year period, and to study the relationship between psychological status and these chronic subgroups of temporomandibular disorders (TMD) in non-patients. A total of 211 subjects (males 47%, mean age 46 years; standard deviation 6) attended examinations in 1999 and 2000 performed according to the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD). Chronic myofascial pain was found in 7% and chronic disk displacement with reduction in 11% of subjects; new diagnoses were made in only 4% and 1% of the subjects, respectively. An increase in the level of somatization by 1 step increased the probability of having chronic myofascial pain by over 3 times ($P=0.006$). Myofascial pain and disk displacement with reduction seem to be relatively common and fluctuating in nature in non-patients. As somatization associated significantly with myofascial pain, this should be borne in mind in the management of TMD. The results strengthen the rationale of the biopsychosocial orientation in health care. □ *Non-patient; psychosocial; RDC/TMD; somatization; temporomandibular disorders*

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The prevalence of facial pain has been reported to be between 10% and 26% in the general population (1–4), while the prevalence of clinically significant temporomandibular disorder (TMD)-related jaw pain has been estimated to be between 3% and 5% (5, 6). The most common symptom of TMD is pain (7), and it has been reported that myofascial pain constitutes at least half of the cases with TMD (8). In addition, TMD has been found to be twice as common in women than in men in the general population and even 4 times more common in women in patient populations (2, 7).

TMD and psychological factors (e.g. anxiety, depression, somatization) are reported to be associated (9–13), while the exact etiology and pathophysiology of myofascial pain have remained unclear (14, 15). Of the most common diagnostic subgroups of TMD, myofascial pain seems to be more associated with psychosocial issues than temporomandibular joint (TMJ) internal derangements (16, 17), but the number of studies based on TMD subgroups is limited (11) and further investigation has been suggested (9). Moreover, etiologic studies on TMD should be directed at psychosocial factors, including stress, depression, and somatic distress (2).

Several methods have been introduced for assessing and classifying TMD (18–22). The Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) were developed to provide detailed criteria for assessing TMD (23). Multiple physical diagnoses (Axis I) are permitted for each subject and a dual-axis classification is applied to psychosocial issues (Axis II). The reliability

and validity of the RDC/TMD has been confirmed (24, 25) and the Finnish version of Axis I was recently successfully used in non-patients (26).

This study aimed to determine chronic groups of myofascial pain and chronic disk displacement with reduction over a 1-year period and to study the relationship between psychological status and these chronic subgroups of TMD in non-patients.

Materials and methods

In March 1999, a standardized, self-administered questionnaire was mailed to all 30- to 55-year-old employees of the Finnish Broadcasting Company Ltd. whose employment in the Helsinki area had lasted at least 5 years. The data have been described in more detail earlier (13, 26, 27). Of the 1339 (75%) subjects who completed the questionnaire, 241 were randomly selected to participate in the clinical baseline TMD study in November 1999. In December 2000, follow-up examinations were conducted on 213 (88%) subjects. Two did not complete the Axis II questionnaire and were excluded from the study.

A total of 211 subjects (males 47%, mean age 46 years; $s=6$) were examined twice according to the RDC/TMD in a conventional dental chair at the company's dental clinic by the same calibrated dentist (MR). The RDC/TMD, which includes 2 axes, allows standardization and replication of research related to the stomatognathic system. Both axes

were used: Axis I was applied to clinical TMD, and Axis II to pain-related disability and psychological status. The diagnoses of myofascial pain and myofascial pain with limited opening were combined within the category of myofascial pain, and disk displacement with reduction in either or both TMJs was considered to be disk displacement with reduction. These diagnoses were recorded as chronic if made at both examinations.

Psychological (depression, somatization) and psychosocial (graded chronic pain) status were assessed at the end-point examination according to the RDC/TMD Axis II. The subjects completed the Finnish translation of the RDC/TMD history questionnaire, the suitability of which was evaluated in a pilot study. Depression and somatization (non-specific physical symptoms with pain items) were categorized within three groups: normal, moderate, and severe. Classification was done by calculating raw mean scores for these scales and by dividing the subjects by percentiles: normal below the 70th percentile, moderate above the 70th percentile, and severe above the 90th percentile on the study population ($n = 211$) (23).

All subjects had free access to the company's dental clinic and occupational health care during the follow-up period. They had had courses of conservative treatment on the basis of their subjective needs as well as normative needs assessed by health-care professionals. Of the chronic myofascial pain group, 6 had had an occlusal splint, 1 was treated with physiotherapy and 3 had received both occlusal splint and physiotherapy. Five subjects were not treated at all.

Ethics approval was obtained from the University of Helsinki, Institute of Dentistry Ethics Committee.

Statistical methods

The chi-square test was used to study the significance of the associations for the variables by age and gender. Logistic regression models were fitted to analyze the effects of age, gender, depression, and somatization on the probability of having chronic myofascial pain and disk displacement with reduction. Age groups (30–39, 40–49, 50–55), gender (women = 0, men = 1), and depression and somatization grades (normal, moderate, severe) were included as independent variables. The forced entry method was used, i.e. the independent variables were entered in the multivariate models in a single step. All analyses were performed with SPSS statistical software, version 11.0 (SPSS Inc., Chicago, Ill., USA).

Results

The occurrence of myofascial pain was 14% ($n = 30$) and disk displacement with reduction 18% ($n = 37$) at baseline, and at follow-up 11% ($n = 23$) and 12% ($n = 26$), respectively. Chronic myofascial pain was present in 7% ($n = 15$) and chronic disk displacement with reduction in

11% ($n = 24$) of participants. Of these, 2 had both diagnoses. The fluctuation in these diagnostic subgroups of TMD is shown in Fig. 1. In the RDC/TMD Group III a diagnosis of arthralgia was not found at either examination.

Percentage distributions of the Graded Chronic Pain Scale values were as follows: Grade 0 = 82.4%, grade I = 13.3%, and grade II = 4.3%. Grades III and IV were not found. The frequency distributions for chronic myofascial pain, chronic disk displacement with reduction, depression, and somatization by gender and age are given in Table 1.

According to logistic regression, somatization was significantly positively associated with the probability of chronic myofascial pain ($P = 0.006$). An increase in the level of somatization by 1 step increased the probability of having chronic myofascial pain over 3 times, but depression was not associated with either of these diagnoses. Male gender was significantly negatively associated with the probability of having chronic disk displacement ($P = 0.049$) (Table 2).

Discussion

Chronic pain is common among the general population (28, 29). TMD problems are also common, but seem to be more fluctuating in nature (12, 30, 31). The lack of uniform diagnostic methods has led to wide variations in prevalence figures of TMD in earlier studies (5). The RDC/TMD (23), however, has been reported to be a reliable and valid instrument with detailed criteria for assessing TMD internationally (24, 25). In Finland, it was previously used in a cross-sectional study among multi-professional media personnel (26) and the sample for the present study was derived from that database.

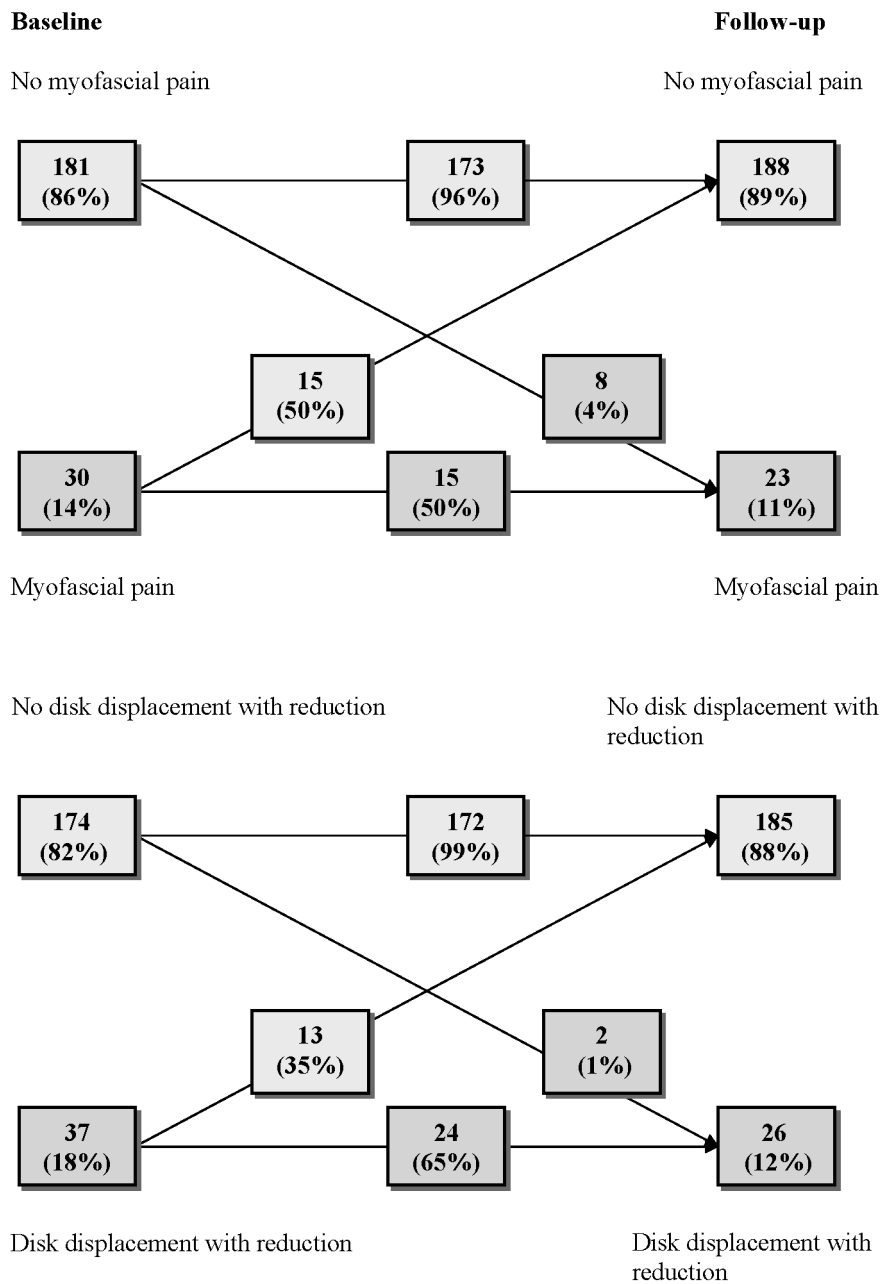
We therefore chose the RDC/TMD to enable as reliable a diagnosis as possible for the most common subgroups of TMD, i.e. myofascial pain and disk displacement, which are known to constitute the majority of TMD in non-patient populations. To increase the reliability of clinical diagnoses for disk displacement, magnetic resonance imaging, whenever possible, is recommended by the RDC/TMD. That was impossible in our non-patient study population. Furthermore, to avoid possible cross-national variations in reporting psychological issues (32), the study population was divided into 3 groups by percentiles to define depression and somatization instead of using the US-based reference values suggested earlier (23).

TMD has been reported to be primarily a condition of young and middle-aged adults, and is approximately twice as common in women than in men in the general population (2). Similarly, in patient populations TMD problems have been found to be more associated with female gender. In the present study, women had TMD problems slightly more often than men in the bivariate analyses, although the difference was not statistically

significant. This may have been due to the relatively small sample size. However, in the multivariate analysis males were found significantly less likely than females to have chronic disk displacement with reduction. Arthralgia, which is a fairly common finding among patients, was not found in this non-patient population, which underscores the difference between patients and non-patients.

Arthralgia was thus unlikely to have been a confounding factor in this study.

We aimed, first, to find those with chronic myofascial pain or disk displacement with reduction and, second, to cross-sectionally analyse whether these states were associated with studied independent variables. We used logistic regression to investigate the associations of chronic



n=211

Fig. 1. Flow chart of subjects with myofascial pain or disk displacement with reduction according to the RDC/TMD (e.g. myofascial pain, myofascial pain with limited opening, and disk displacement with reduction in either or both TMJs) over a 1-year period.

Table 1. Frequency (f) distributions and associations for the variables studied by gender and age. Chi-square test

<i>n</i> = 211	Gender				<i>P</i>	Age group (years)						<i>P</i>
	Women		Men			30–39		40–49		50–55		
	f	(%)	f	(%)		f	(%)	f	(%)	f	(%)	
Chronic myofascial pain					0.258							0.220
Yes	10	(9.0)	5	(5.0)		5	(13.2)	6	(7.1)	4	(4.5)	
No	101	(91.0)	95	(95.0)		33	(86.8)	78	(92.9)	85	(95.5)	
Chronic disk displacement					0.057							0.703
Yes	17	(15.3)	7	(7.0)		4	(10.5)	8	(9.5)	12	(13.5)	
No	94	(84.7)	93	(93.0)		34	(89.5)	76	(90.5)	77	(86.5)	
Depression					0.133							0.281
Normal	75	(67.6)	78	(78.0)		28	(73.7)	58	(69.0)	67	(75.3)	
Moderate	21	(18.9)	16	(16.0)		8	(21.0)	13	(15.5)	16	(18.0)	
Severe	15	(13.5)	6	(6.0)		2	(5.3)	13	(15.5)	6	(6.7)	
Somatization					0.456							0.538
Normal	80	(72.1)	75	(75.0)		26	(68.4)	59	(70.2)	70	(78.6)	
Moderate	22	(19.8)	14	(14.0)		9	(23.7)	15	(17.9)	12	(13.5)	
Severe	9	(8.1)	11	(11.0)		3	(7.9)	10	(11.9)	7	(7.9)	

myofascial pain and disk displacement with reduction with somatization, depression, age, and gender, all thought to have a major effect on TMD. The multivariate approach enabled us to study the independent effect of each background variable on the probability of the studied item while simultaneously controlling the effects of other background variables.

In the present study, a significant relationship was seen between somatization and myofascial pain. Furthermore, the probability of having chronic myofascial pain increased over three times when somatization was increased from normal to moderate or from moderate to severe. This underscores the awareness of the complex relationship between psychological issues and pain, also in non-patient populations. Nevertheless, somatization has been found to be a risk factor for myofascial pain in earlier studies in patients and community (11, 12). It is noteworthy that depression, unlike earlier reported in patient populations, was not associated with myofascial pain (33). This may well have been due to the relatively low

psychosocial dysfunction found in the present non-patient population.

Our results demonstrate that these TMD subgroups are relatively common among non-patients and that the problems fluctuate. In this study, all subjects had equal opportunities for free-of-charge conservative treatment between examinations. They had had courses of treatment on the basis of their subjective needs as well as normative needs assessed by health-care professionals, which may have influenced both prevalence and incidence figures. On the other hand, some of our subjects had persistent problems regardless of the treatment they had received, which is congruent with earlier findings in patients with TMD (34). However, the present study was conducted as a community-based follow-up investigation and the outcomes of such pragmatic setting contribute data comparable to real-life conditions in a multiprofessional working personnel.

In conclusion, myofascial pain and disk displacement with reduction seem to be relatively common and fluc-

Table 2. Regression coefficients (B) of the studied background variables. The probability of chronic myofascial pain or disk displacement, logistic regression

<i>n</i> = 211	Chronic myofascial pain				
	B	S.E.	<i>P</i>	Odds ratio	95% CI for OR
Gender (male)	−0.781	0.607	0.199	0.458	0.139–1.506
Age group	−0.586	0.377	0.120	0.557	0.266–1.165
Depression	−0.104	0.425	0.807	0.902	0.392–2.073
Somatization	1.156	0.417	0.006	3.178	1.403–7.196
<i>n</i> = 211	Chronic disk displacement with reduction				
	B	S.E.	<i>P</i>	Odds ratio	95% CI for OR
Gender (male)	−0.946	0.480	0.049	0.388	0.152–0.995
Age group	0.219	0.306	0.474	1.245	0.684–2.266
Depression	−0.340	0.387	0.380	0.712	0.334–1.519
Somatization	0.532	0.361	0.141	1.702	0.838–3.455

tuating in nature in non-patients. Since somatization associated significantly with myofascial pain, this should be borne in mind in the management of TMD. The results also strengthen the rationale of the biopsychosocial orientation in health care.

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