# A multiprofessional study of patients with myofascial pain-dysfunction syndrome. I

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A research team comprising a dentist, a psychiatrist and two physiotherapists examined 113 female patients consecutively referred because of myofascial pain-dysfunction (MPD) syndrome and, for comparison, 46 female patients who attended the dental clinic for a positively diagnosed dental problem. In both groups all subjects were Norwegians, nearly all in the age of reproduction and belonging to the upper social strata. Every second subject in the Comparison group had perceived some MPD-symptoms. The dentist's main findings in the MPD-patient group were high scores on the Anamnestic index and on the Dysfunction index, and moderate scores on the Occlusal index. The psychiatrist's main findings were high scores on restrained aggression and on anxiety, and tense control of emotions generally. The physiotherapists' findings were general muscular tension and inadequate respiratory function in an upright position.

*Key-words:* Dental; psychiatric; physiotherapeutic evaluations

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Social, emotional and dental factors have been held to be etiological factors in the development of myofascial pain-dysfunction (MPD) syndrome (9, 13, 14, 20, 29, 36). Clinical studies that focus on the occurrence of such factors or problems among MPD-patients compared to that in other groups of dental patients are, however, rare (13).

This investigation is concerned with possible dental, psychological and neuromuscular differences between female patients seeking advice for MPD and other female dental care attenders.

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## MATERIAL AND METHODS

### *The MPD-group*

All female patients aged 18 and over, referred to the Department of Oral Surgery and Oral Medicine at the University of Oslo, because of TMJ-disorders during the period 1. Sept. – 1. Dec. 1976, were guided to a research team consisting of a dentist (BH), a psychiatrist (ANH) and a physiotherapist (BSK). The total number of patients was 121. Of these, seven were excluded because of detectable TMJ-diseases, and one patient dropped out after referral, leaving 113 subjects in the MPD-group (Table 1).

Table 1. *The MPD-patient group (n = 113) and the Comparison group (n = 46) according to psychiatric assessments of capacity for interpersonal contact (CIC) (16) expressed as percentages.*

| | MPD-patient | Comparison |
|---|---|---|
| Apparently good CIC | 39 | 43 |
| Mildly disturbed CIC | 37 | 43 |
| Severely disturbed CIC | 24 | 13 |
| Total | 100 | 99 |

*The comparison group*

A group of 46 female patients referred to the Department of Oral Surgery and Oral Medicine at the University of Oslo because of definite dental problems (e.g. unerupted canines or third molars, apical periodontitis etc.) was selected and examined during the research period, 1. Sept. 1976 – 30. April 1977.

The group was composed to match the background characteristics of the MPD group regarding sex, age and social class. Thus all female patients referred to the clinic during the research period formed the population from which the Comparison group was selected by quota sampling using age and social class (23) as criteria.

*General procedures*

All patients were examined by the dentist and by the psychiatrist. One of the physiotherapists (BSK) had been trained during three years in "psychomotoric physiotherapy" (according to a technique developed by Braatöy/Bülow-Hansen (for review, see Heiberg (16)). Due to lack of capacity, an arbitrarily selected half of the patients were examined by her. The rest of the patients were examined by a physiotherapist with a basic education. Her examination procedures entailed fewer variables; therefore the physiotherapists' results were not comparable (16). In this study only the findings of BSK (42 MPD-patients, 26 Comparison patients) are taken into account. All examinations were performed independently, i.e. no member of the team had access to the others' findings until the total examination procedure was completed and treatment was to be provided. The dentist was the only member of the team supposed to know the cause of referral of each patient.

During the research two patients usually were examined per day. While some patients belonging to the Comparison group had to be examined in between, appointments were made with some of the MPD-patients weeks ahead of their day of referral. The Comparison group did not, however, have to wait for examination.

*The dentist's approach*

The diagnoses were based upon past oral symptom history and clinical and radiographical examination. With the patients' permission, a tape recorder was used at the interview on oral history. One Comparison patient rejected the use of tape recorder, no MPD-patients did.

Perceived oral symptoms relevant to the Anamnestic index ($A_i$) suggested by Helkimo (17), were gathered into the $A_i$. In addition all patients were asked if they had ever had orthodontic treatment, and of the regularity of dental treatment. The clinical examination included palpation of the TMJs and muscles according to the methods suggested by Carlsson et al. (5). These findings were gathered into the Dysfunction index ($D_i$) (17). Occlusal examinaton was only performed clinically. Fixed prosthetic restorations were recorded, and the findings were gathered into the Occlusal index ($O_i$) (17). The radiographic examination consisted of orthopantomographs and lateral oblique transcranial TMJ-radiographs, standard

projection. Tomographs were taken additionally when there was doubt whether a TMJ-lesion was present.

*The psychiatrist's approach*

A psychiatric, semistructured interview lasting for 1–2 hours was conducted. Data were obtained on family history, sexual and marital life, health record, personality traits and possible stress factors within the last two years. The patients were grouped into one of three broad categories according to assessments of the patients' capacity for interpersonal contact.

Good capacity of interpersonal contact was defined as "capacity for entering into a mature, mutual and equal relationship with another person. The emotional relationship is flexible and balanced and may vary from intimacy and closeness to distance and objectivity". (Further details and examples have been reviewed (16)). The following categorization was based upon assessed deviation from this ideal:

a) *Apparently good* capacity for interpersonal contact (CIC),
b) *Mildly disturbed* capacity for interpersonal contact (CIC),
c) *Severely disturbed* capacity for interpersonal contact (CIC).

The patients were also assessed according to common psychiatric diagnostic system. For a supplement and a corrective the Minnesota Multiphasic Personality Inventory (MMPI) was used and scored by a psychologist who did not see the patients (16).

*The physiotherapist's approach*

The examination procedure was in principle non-verbal. It was based upon principles described by Bülow-Hansen (4) and further systematized by Bunkan (3) and Sundsvold (37). It comprised

a) Inspection of body posture in an upright and in a lying position (33 variables)
b) Inspection of respiration in an upright and in a lying position (7 variables)
c) Estimation of resistance to passive movements; i.e. the patient was supposed to remain passive while the physiotherapist stretched her muscles (13 variables)
d) Estimation by palpation of muscular tension according to the system described by Bunkan (3) (42 variables), and
e) Estimation of autonomic and emotional reaction to the examination.

The findings were summarized into indices and categorized as adequate or inadequate according to guidelines described by Bunkan (3).

*Statistical evaluation*

Differences in findings between the subgroups were evaluated by means of the chi-square test.

## RESULTS

### The dentist's findings

*Anamnestic reports*

The chief complaints of the MPD-patients were mainly pain on function or restriction of mandibular mobility. Ten per cent of the group reported clicking which was perceived as socially disturbing, and ten per cent reported a constant, dull ache as the chief complaint. The Comparison group attended the clinic because of toothache, constant or only on function, or just to have an unerupted tooth examined. Every fifth patient out of each group had received some sort of orthodontic treatment. Sixty-six per cent of the MPD-patient group and 62 per cent of the Comparison group saw their dentist twice a year, 24 per cent and 26 per cent respectively, saw the dentist once a year. Only 10 and 12 per cent respectively, were irregular dental treatment attenders.

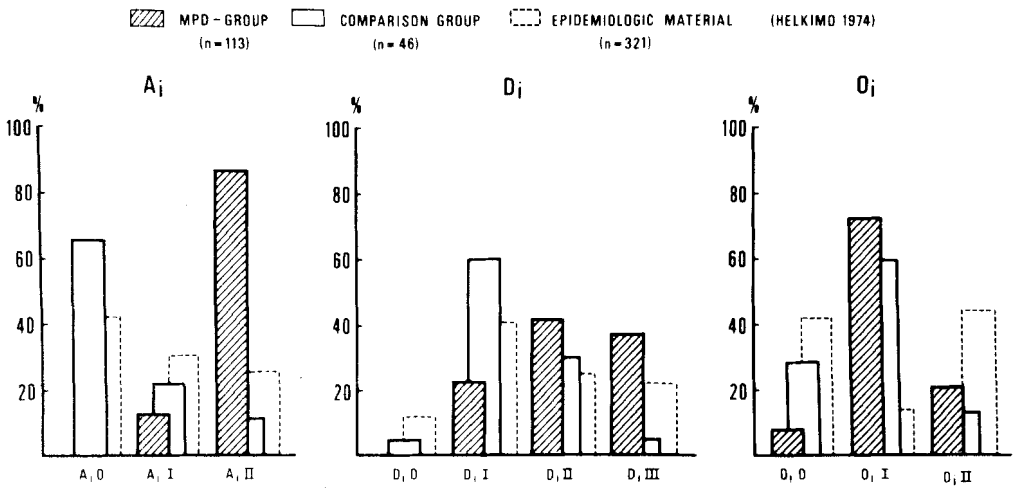


Fig. 1. Composition of the Anamnestic index ($A_i$), The Dysfunction index ($D_i$) and the Occlusal index ($O_i$) in the MPD-patient group, the Comparison group and in the epidemiologic material collected by Helkimo (1974)

*Findings according to Helkimo's indices*

Fig. 1 shows that the MPD-patient group was overweighted by patients reporting severe symptoms, while the Comparison group reported mainly mild or no symptoms. Compared to the findings of the epidemiological study in Northern Finland (17), both of the groups in the present study differed markedly according to the $A_i$. Regarding the $D_i$ highly significant differences were found between the patient groups in the present study. This was valid for all components included in the $D_i$ As will be seen from Fig. 1, a smaller proportion of the Comparison group was found to have severe disturbances than was the case in the MPD-patient group and in the Northern Finland material. On the other hand, a finding common to the Comparison group and the Northern Finland material, was that both reported severe symptoms less often than the clinical findings would indicate, while the MPD-patient group reported severe symptoms more often than the clinical findings suggested. According to the $O_i$ both groups had only mild disturbances and were found to be more satisfactory concerning all components of the $O_i$ than was the case in the material from Northern Finland. However, the MPD-patients were found to be less satisfactory concerning $O_i$-components than was the Comparison group, although only one component, the occlusal interferences between RCP and IP (17), was found to make any significant difference ($p < .01$).

*Malocclusion*

Twenty per cent of the MPD-patient group had an overjet of 5 mm or more, ten per cent had an overjet of 6 mm or more. Only one person belonging to the Comparison group had an overjet of 5 mm. No differences were found between the groups regarding vertical overbite or other patterns of occlusion.

## The psychiatrist's findings

*Capacity for interpersonal contact (CIC)*

The results of a basic screening according to assessed capacity for interpersonal contact (CIC) are shown in Table 1.

*Personality traits*

Control of emotions, especially of aggressive nature, was a main finding among the MPD-patients (16). Restrained aggression was found in 58 per cent of the MPD-patient group and in 40 per cent of the Comparison group ($p < .01$). Both groups had high scores on Anxiety on the MMPI-scale.

*Childhood*

A significantly higher proportion of the MPD-patient group (31 per cent) than of the Comparison group (17 per cent) had experienced loss of contact with one parent due to divorce, death or longstanding disease during childhood or early adolescence (16).

*Psychiatric disturbances*

No significant difference was found between the groups with regard to psychiatric disturbances (16).

*Somatic illness*

Except for recurrent headache, no difference was found between the groups. Sixty-eight per cent of the MPD-patient group and 36 per cent of the Comparison group reported being troubled by recurrent headache.

Ten per cent of the MPD-patient group, however, reported having experienced several illnesses and had used health services heavily.

*Social stability*

The majority within both groups had a history of social stability, i.e. they had moved within the social stratum of their parents or one step upwards due to education and/or marriage (23) (Table 2). They were married, engaged to be married or widows, had a full or part-time extradomestic occupation, had 1–3 children if married, and lived in established, urbanized areas. Remarkable deviations from this pattern (for instance a low social status combined with a history of broken marriages and rural residence) were found in 10 per cent of the MPD-patient group and in 5 per cent of the Comparison group.

Table 2. *The MPD group (n = 113) and the Comparison group (n = 46) according to age, present social class and social class of parents (23), expressed as percentages*

| *Age group* | *18–19* | *20–29* | *30–39* | *40–49* | *50–59* | *60+* |
|---|---|---|---|---|---|---|
| MPD-patient group | 5 | 35 | 23 | 19 | 14 | 3 |
| Comparison group | 4 | 44 | 23 | 13 | 13 | 4 |

| *Social class* | Class I | Class II | Class III |
|---|---|---|---|
| MPD-patient group | 15 | 73 | 13 |
| Comparison group | 32 | 55 | 13 |
| *Social class of parents* | | | |
| MPD-patient group | 8 | 52 | 40 |
| Comparison group | 13 | 51 | 36 |

The physiotherapist's findings

The data are published in detail elsewhere (16).

General muscular tension, especially in an upright position, characterized the MPD-patient group. Most of these patients were, however, able to relax in a lying position. The characteristics which significantly distinguished the MPD-patient group from the Comparison group ($p < .01$), were the following:

a) Protruded position of the head
b) Inadequate (reduced) respiratory function of lower belly
c) Reduced passive mobility of lumbal columna

All of these findings were made with the patient in an upright position. Further characteristics of the MPD-patient group were:

d) Tense biceps dexter muscle
e) Tense sacrospinalis cervicalis dexter muscle and
f) High scores on indices regarding tense musculature of trunk and jaws bilaterally.

*Relationship between findings*

The bulk of the MPD-patient group was found to have high scores on the Anamnestic and the Dysfunction indices and moderate scores on the Occlusal index. They were found to have an apparently good or mildly disturbed CIC by the psychiatrist and to have a consistent, generally tense neuromuscular pattern and reduced respiratory function of lower belly in an upright position by the physiotherapist.

Most of the MPD-patients with an overjet of 5 mm or more had moderate scores on all indices.

The patients classified by the psychiatrist as having a severely disturbed CIC, were found to have a neuromuscular pattern deviating from the other patients by the physiotherapist. These patients also had a history of heavy health service use and of more social instability than the other groups (18).

The patients of the Comparison group who reported perceived MPD-symptoms mainly belonged to the subgroup which was found to have a mildly disturbed CIC and had moderate scores on the Helkimo indices. The psychiatric, neuromuscular and social characteristics of this subroup were similar but not identical with those of the MPD-patients with a mildly disturbed CIC. The emotional control was found to be less pronounced, skeletal musculature less tense, and more social instability was found among these patients.

## DISCUSSION

Behavioural patterns are closely related to sex and aspects of adulthood (12), and psychological and neuromuscular systems are highly influenced by these patterns (1). Since literature on MPD-patient materials unanimously reports great overrepresentation of adult females (6, 20, 34), women were chosen as the target of investigation. The Comparison group, though numerically smaller, was comparable in social characteristics, also concerning the condition of being a dental patient. The radiographic examination would secure a homogeneous material according to TMJ-diagnoses (28).

Clinical evaluations are always inflicted with many pitfalls. The problems of intra-examiner variability were the most conspicuous in this study. All members of the team were exposed to the possibility of intra-examiner changes of assessments during eight months. Additionally they were all exposed to the possibility of subconsciously changing manners, techniques and perceptual skill from one patient to another, due to the examiner's own possible conflicts, prejudices or preoccupations (2, 38). The taking of an oral history by a verbal process has been questioned (32). The point that a team consisting of women solely examined

groups of women, also represents certain implications (2). However, the use of a tape recorder (giving the possibility of reassessment of the oral symptom histories), the use of the MMPI as a corrective to the psychiatrist, the researchers' long clinical experience and a systematic consultation of experienced colleagues, probably mean that great systematic error has been avoided.

The individuals found to have severely disturbed capacity for interpersonal contact (CIC) proved to have several characteristics in common with the multiproblem patients previously described (20). They could not, however, be distinguished from the rest of the group by means of the purely dental characteristics evaluated in Helkimo's indices.

The prevalence of MPD-symptom reports in the Comparison group was surprisingly high compared to previous findings (19).

*Resemblances of the MPD-patient group and the Comparison group*

The slight difference of mean age between the groups (32 yrs. vs. 30 yrs.) probably is of no importance (Table 2). A greater proportion of the Comparison group was categorized into Social class I due to their present position as University students. Probably, this numerical difference also is of no importance as young females are now more frequently students for some years, because norms and values of middle and upper class female behaviour differ little (22), and because female behaviour is highly influenced by the mother (8, 31). Probably, more important is the equal distribution of Social class III-individuals, since female attitudes in this social stratum clearly deviate from those in the other strata (21, 22).

These groups of women were not troubled by problems such as delinquency or drug addiction in the family, several broken relationships or single motherhood, which would be regarded as socially stigmatizing by the middle class. On the contrary, all available information on social situation indicated that these women tried to and managed fairly well to live up to the standards of a successful middle class woman, who should be clever, controlled, dutiful, good-looking and domestically oriented, and whose children should be a reflection of this image (39).

Orientation towards orthodox health service offers, belief in specialists and specialization are also parts of this pattern, as is a somatic and preventive health orientation and the rejection of sick role behaviour (27). The practice of regular dental care attendance and consultation with dental specialists when an alarming condition like pain or limited jaw mobility occurs, fit well into this image.

*Differences between the MPD-patient group and the Comparison group*

The MPD-patient group had sought advice for neuromuscular oral disorders, the Comparison group had not. However, half of both groups reported having perceived moderate clicking and/or fatigue of masticatory muscles. Thus among those individuals not prone to take up the sick role behaviour these symptoms could be registered as subclinical.

Several findings, such as restrained aggression (7), lack of experience of aggressive feelings, general control of emotions, inadequate respiratory function in an upright position, generally tense muscles of the total stretching muscle apparatus (11), recurrent headache (26), extremely high scores of the Anamnestic index ($A_i$) (17), high scores of the Dysfunction index ($D_i$) (17), moderate scores on the Occlusal index ($O_i$) (17) (especially regarding occlusal interferences), a higher prevalence of overjets of 5 mm or more, and a higher prevalence of early contact loss with one parent, significantly differentiated the two groups. Though

apparently an odd combination of findings, these may, however, represent basic elements in the understanding of the multifactorial etiology of oral neuromuscular disorders (33). The previous findings regarding headache and muscular problems in MPD-patients (11, 26) may support the hypothesis that some etiologic factors of MPD are derived from sex role patterns, on the assumption that the controlled middle class woman ideal (39) is still valid and that a continual control of aggressive feelings requires static neuromuscular activity (1).

A girl whose mother aspires socially upwards is supposed to behave nicely and to be good-looking. Nice behaviour in this context means to make little noise and to restrain explorative and aggressive activities to a higher degree than male siblings or peers (35). This implies that a pattern of restricted muscular as well as emotional outacting, is expected to be present at an early stage of life, and may be reestablished in connection with emotional traumas like the menace of loss of a beloved person. During such circumstances emotional control means restriction of respiratory function and of use of the neuromuscular stretching apparatus. An emotionally and neuromuscularly holding attitude like this was a common characteristic in the MPD-patient group and in those of the Comparison group who had perceived MPD-symptoms, though it was less pronounced in the latter group.

When such an adult is exposed to aggression-provoking situations, her anxiety preparedness may be subconsciously reactivated. Central to this preparedness pattern is a superficial respiratory function.

An interesting point is that masticatory muscles are derived from the gill bows and thus phylogenetically closely connected to the respiratory system (25). These muscles may by nature be exposed to dysfunction when the patient is in a state of anxious aggression (1).

Centrally induced hyperactivity of jaw closing muscles may cause local muscle damage (40), while experimentally induced severe occlusal interferences cause pain in muscles and joints (30). Moreover, neuromuscular treatment is only found to lead to a decrease in the MPD-symptoms and an increase in the consistency of occlusograms (10). These findings, seen in context, suggest a reciprocal effect between the passive and the active parts of the oral motorial system. The overweight of moderate occlusal interferences among the MPD-patients and among those in the Comparison group who had experienced MPD-symptoms, may thus be due to minor, hardly detectable interferences aggravated by the neuromuscular tension.

Protruding teeth do not fit well into the good-looking female ideal. One patient put it like this, "All my life I have been afraid of looking foolish like a rabbit". Her visible efforts to hide her overjet possibly represented a contributory factor to her top score on the Dysfunction index.

To conclude, several mild general and local disturbances may cause high scores on the Anamnestic index as well as on the Dysfunction index. Whether, or rather how, these symptoms affect the seeking of treatment for MPD is conceivably dependent upon sociocultural patterns of perceived medical problems, sex role behaviour and sex role expectations.

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