

ORIGINAL ARTICLE

A follow-up study of subjective symptoms of temporomandibular disorders in patients who received acupuncture and/or interocclusal appliance therapy 18–20 years earlier

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Abstract

Objective. To evaluate the presence of symptoms of temporomandibular disorders (TMDs) in patients referred to a specialist clinic because of muscular problems 18–20 years earlier and who had received mainly acupuncture and/or interocclusal appliance therapy. **Material and methods.** Sixty-five subjects who had received therapy at a TMD specialist clinic 18–20 years earlier were mailed a questionnaire with questions about TMD symptoms, their attitude towards the therapy, and their opinion about the outcome. Fifty-five subjects (85%) answered and returned the questionnaire. **Results.** Before therapy, 87% had had severe TMD symptoms, but this figure decreased to 38% at the long-term follow-up. The mean values of the subjects' complaints at worst and at best before treatment, measured with a visual analog scale, were 66 (range 26–100) and 31 (range 0–100), respectively. The corresponding figures at the long-term follow-up were 32 (range 0–96) and 16 (range 0–70). Headache at least once a week was originally reported by 73% of the women and by 77% of the men. Headache prevalence 18–20 years later was 35% in women and 54% in men. The majority of patients were positive about the therapy they had received, and would recommend it to a friend with similar complaints. **Conclusions.** A majority of the patients reported a lasting improvement in their symptoms. Patients' overall opinions of the therapy received were positive.

Key Words: CMD, efficacy, headache, long-term, questionnaire

Introduction

It is well known from epidemiological research that temporomandibular disorders (TMDs) are common in the population [1,2]. Studies have shown that a variety of different therapies, separately or in combination, have a positive effect on functional impairment and functionally related pain conditions in the masticatory system, at least in a short-term perspective [3,4]. The long-term results of such therapies are less well documented [5,6].

In a previous study, it was concluded that the majority of TMD patients receiving either acupuncture or interocclusal appliance therapy were significantly improved at a follow-up after one year [3]. The aim of the present study was to evaluate the presence of TMD symptoms 18–20 years after therapy in a sample of TMD patients referred to,

and treated at, a specialist clinic for muscular problems. The hypothesis was that the reduction in TMD symptoms after therapy would persist on a group basis.

Material and methods

The original patient material comprised 80 patients referred to the Department of Stomatognathic Physiology, Institute for Postgraduate Dental Education, Jönköping, Sweden, and who commenced therapy during the time period April 1987 to March 1989. All the patients had TMD symptoms of mainly muscular origin, with a duration of at least 6 months and a clinical dysfunction index of II or III according to Helkimo [7]. They were randomly allocated to receive therapy with either acupuncture or interocclusal appliances. Twenty-seven patients

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(34%) who did not respond positively on the first therapy were given the other one. Twenty of these subjects also needed other additional therapies, such as physiotherapy, occlusal adjustments and pharmacological treatment during the treatment period.

The acupuncture therapy was performed in 30-min sessions on 6–8 occasions. The method has been described in detail previously [8]. The interocclusal appliances were all hard acrylic stabilization appliances designed according to the principles described by Clark [9].

The outcome one year after the end of therapy has been presented earlier [3]. Six years after the end of therapy, all patients were invited to fill in a follow-up questionnaire evaluating the perceived long-term effect. Out of the original 80 patients, 51 women (76%) and 16 men (24%) filled in and returned the questionnaires, giving a response rate of 84%.

In December 2006, in a search of the Swedish National Population Register, it was found that 2 of the 67 subjects who participated in the 6-year follow-up had deceased. The other 65 subjects were mailed a questionnaire and a consent form with information about the study. The questionnaire included questions about current TMD symptoms experienced once a week or more often. The symptoms asked for were temporomandibular joint (TMJ) sounds, tiredness or fatigue in the jaw muscles, difficulty opening the jaw wide, pain in association with jaw movements, and orofacial pain. An anamnestic dysfunction index, in accordance with Helkimo, was calculated from these answers [7]. If a subject reported joint sounds and/or tiredness or fatigue in the jaw muscles alone, the subject was allocated an anamnestic index I, while a positive answer on any of the other three questions rendered an anamnestic index II. All subjects were asked whether they experienced headache once a week or more often.

Two questions were answered on a 10-grade numerical scale. The questions were: "What is your opinion about the therapy that you received 18–20 years ago?" with the end definitions "Not good at all" and "Very good", and "Would you recommend a friend with similar symptoms to receive the same treatment as you did?" with the end definitions "Not at all" and "Completely".

Finally, the subjects were asked to grade their TMD pain complaints at worst and at best before therapy 18–20 years previously, using a 100 mm long visual analog scale (VAS), but also to grade present complaints at worst and at best using the same scale. All subjects who had had interocclusal appliance therapy were also asked for the length of time they had continued to use them.

A reminder was mailed to the non-responders after 3 weeks. Completed questionnaires were returned by 55 subjects, making a participation rate of 85%. In two questionnaires, it was not possible to identify the responder to gender and age. One of

these subjects had received acupuncture therapy only, while the other one had been given an interocclusal appliance.

The results from the present follow-up have been compared with data collected before the start of therapy, as well as data collected after 1 and 6 years, respectively.

Statistical methods

The chi-squared test was used for changes of the anamnestic dysfunction index, as well as for changes in reported headache. To test for changes in pain intensity, registered with a VAS scale, the Wilcoxon matched-pairs signed-ranks test was used. A p -value <0.05 was considered as statistically significant.

Results

Forty of the participants were women and 13 were men. Their mean age at the 18–20 years' follow-up was 61 (range 43–88 years).

According to available information, 17 subjects had received only interocclusal appliances, 10 acupuncture therapy only, and the remaining 28 subjects both therapies. Furthermore, 16 of the 28 subjects who had experienced both therapies had also received one or more other adjunct therapies during the first treatment period or, in some cases, during subsequent years. The adjunct therapies reported were physiotherapy, therapeutic jaw muscle exercises, selective occlusal adjustment, pharmacologic treatment, and intra-muscular injections with local anesthesia.

The distribution of patients according to the anamnestic dysfunction index is presented in Figure 1. Before therapy, 87% reported severe TMD symptoms, a figure that gradually decreased to 55% by the 1-year follow-up. There was a further decrease of severe symptoms to 47% and 38% at the 6-year and 18–20 years' follow-up, respectively. The improvement in the anamnestic dysfunction index, compared to the pretreatment situation, was statistically significant at all three follow-ups

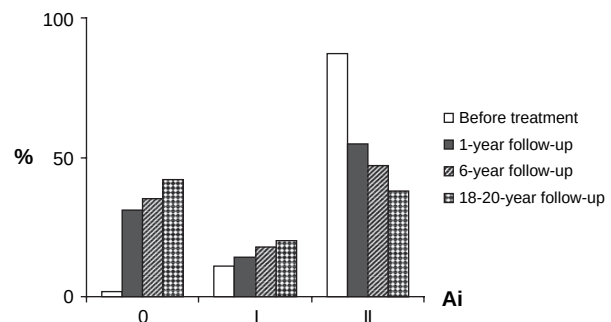


Figure 1. The distribution of patients according to the anamnestic dysfunction index (Ai) on 4 occasions. Percentage distribution.

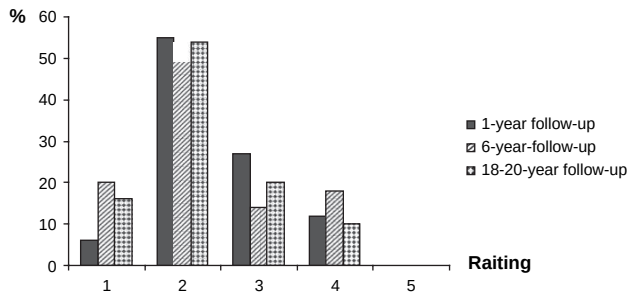


Figure 2. The patients' evaluation of therapy effect on three occasions. Percentage distribution (1 = Completely free from previous symptoms. 2 = Significant improvement. 3 = Some improvement. 4 = No change. 5 = Impairment).

($p < 0.001$) and also between the 1-year and 18–20 years' follow-up ($p < 0.05$). Only 42% were completely free from subjective TMD symptoms at the final registration.

Seventy-three percent of the women and 77% of the men reported headache at least once a week before therapy. These figures had decreased to 49% and 69%, respectively, at the 1-year follow-up. This improvement was statistically significant in women ($p < 0.001$), but not in men. Reports of frequent headache decreased further to 37% in women and 54% in men at the 6-year follow-up, and the decrease was now statistically significant in both genders ($p < 0.001$ and $p < 0.01$, respectively). No further improvement was found between the last two follow-ups, and 18–20 years after therapy headache was reported by 35% of the women and by 54% of the men.

The mean value for the patients' grading of their complaints at worst before therapy, using the VAS scale, was 66 (range 26–100). At the 18–20 years' follow-up, the corresponding figure was 32 (range 0–100; $p < 0.001$). Grading of the complaints at best before therapy was 31 (range 0–96), a figure that had decreased to 16 (range 0–70; $p < 0.001$) at the final follow-up.

Patients' opinions about change in their original TMD symptoms at 1, 6, and 18–20 years' follow-ups are presented in Figure 2. It can be seen from these figures that 82% to 90% experienced a varying degree of improvement.

The patients were also asked to grade their personal opinion about their TMD therapy, and whether they would recommend it to a friend with similar complaints, according to a 10-grade scale (Tables I and II). A majority judged the therapy to be very good, and with few exceptions also stated that they would recommend it to a friend with similar complaints.

Forty-five of the 55 subjects who participated in the long-term follow-up had received an interocclusal appliance as their sole therapy (31%) or as a part of their TMD therapy (51%). Twelve of these (27%) stated that still – after 18–20 years – they used interocclusal appliances frequently (3 subjects) or regularly (9 subjects) at night.

Discussion

The loss of participants in follow-up studies always involves a risk when the results are interpreted. At the 6-year follow-up, information was lacking from 13 patients (16%), and at the final follow-up after 18–20 years, another 12 subjects were lost, giving a total loss of 31% of the original patient sample. Taking into account the long time period covered by this investigation, 18–20 years, this loss can be seen as acceptable, but it should be considered when the results are analyzed and interpreted.

In agreement with a large number of previous studies on TMD patients, three out of four patients in the present sample were women. Overall, pain is a more common symptom in women than in men, and women seek medical care because of pain more frequently than men do. Many plausible explanations for this gender difference have been presented, but knowledge in this field is still incomplete [10].

Functional impairment and pain in the masticatory system is a frequent finding in the population. It has been estimated that approximately one-fourth of 35-year-olds in Sweden have an active need for some kind of TMD therapy, a figure that gradually decreases to 14% among 50-year-olds and to 7% among 65-year-olds [2]. Six percent of the population in the USA suffers from pain in the jaw and/or face [11], and TMD is considered the most common cause of such pain [12]. It is also said to be one of the biggest problems in health care for both clinicians and patients [13].

The TMD therapies performed in the present study resulted in significant improvement of the patients' symptoms. Not less than 82% to 90% reported a varying degree of improvement on the follow-ups after 1, 6 and 18–20 years. Furthermore, at the final follow-up after 18–20 years, the patients reported on average a 50% reduction of their original pain measured with a VAS scale, when the pain was both at its worst and at its best. This improvement is in accordance with several previous studies showing that 75% to 85% of patients with long-standing orofacial pain will improve after TMD therapy,

Table I. Fifty-one patients answer to the question "What is your opinion about the therapy that you received 18–20 years ago?"

Not good at all	1	2	3	4	5	6	7	8	9	10	Very good
No. of patients	1	0	0	1	7	6	5	4	3	24	N = 51

Table II. Fifty-one patients answer to the question "Would you recommend a friend with similar symptoms to receive the same treatment as you did?"

Not at all	1	2	3	4	5	6	7	8	9	10	Completely
No. of patients	0	0	0	1	4	3	1	2	6	34	N = 51

irrespective of type of treatment, or combination of treatments, they have received [14].

Of course, it could be argued that grading of original pain complaints after 18–20 years is biased. Assessment of pain and discomfort based on memory plays an important part in evaluation of treatment results in clinical work. Examiners often ask patients to estimate their pain compared to pretreatment levels. According to previous studies, recall of pain is poor [15], and it has been found that patients tend to overestimate pretreatment pain levels [16–18]. This must be considered when the present results are interpreted.

Because of the long time period since the original intervention, also other factors, e.g. additional therapies, continued use of interocclusal appliances, regression to the mean, and spontaneous remission of symptoms, must be taken into account.

These confounding factors have to be considered. Nevertheless, on a group basis, a significant improvement of the original symptoms was reported in the present study. It is stressed, however, that only 42% were completely free from TMD symptoms at the final follow-up, and 38% of the former TMD patients still had severe subjective symptoms according to the anamnestic dysfunction index used. This is a much higher figure compared to the prevalence figures of severe TMD symptoms that have been presented in epidemiological studies [1,2].

Also in respect of reports of frequent headache, the present sample differed from epidemiological materials. At the 18–20 years' follow-up, 54% of the men and 35% of the women, making a total of 40%, reported that they experienced headache at least once a week. The corresponding figures for frequent headache found in Swedish epidemiologic studies are much lower, where 10–12% of men and 22–23% of women report such frequent headache [19,20]. In the present sample, men reported frequent headache more often than women did. This difference from what is found in epidemiological studies, where frequent headache is more common in women compared to men, is difficult to explain.

It is obvious that these previous TMD patients, despite the TMD therapy they had received and other possible influencing factors, still had more TMD symptoms, including headaches, compared to what one might expect in the population.

The primary aim of this study was to compare the treatment outcome on mainly muscular symptoms of interocclusal appliances and acupuncture, respectively. Such comparisons were also possible in a short-term perspective [3]. In a longer time perspec-

tive, a majority of the patients (51%) received both therapies, and not less than 29% also received one or more other adjunct therapies. Due to this, it was not possible to compare differences in effect and efficacy of interocclusal appliances and acupuncture in a long-term perspective. It is also well known from previous studies that TMD patients have a propensity to seek many different therapists and to receive many different therapies [21–23].

Despite the fact that many of the former patients still reported subjective TMD symptoms, the majority were positive to the therapy that they had received 18–20 years previously. This positive attitude was also reflected by the finding that almost all of them would recommend the same therapy to a friend with similar complaints.

It has previously been reported that half of the patients who had received an interocclusal appliance due to TMDs still used it regularly at night 30 months after treatment [24]. A somewhat unexpected finding in the present study was that as many as 12 out of 45 subjects who had received an interocclusal appliance (27%) still – after 18–20 years – used it frequently, even regularly, at night. One likely explanation is that this therapy is only symptomatic in many cases, and the patients have found out that exposition of the appliance will result in relapse or impairment of their TMD symptoms.

Conclusions

- A majority of patients who had received TMD therapy 18–20 years previously reported a lasting improvement of their symptoms.
- Despite this improvement, previous TMD patients still reported more TMD symptoms, including headache, compared to what is found in epidemiological studies.
- The majority of the patients were very positive to the therapy that they had received, and would recommend it to a friend with similar complaints.
- More than one-fourth of those who had received an interocclusal appliance still used it frequently or regularly at night.

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