Response to occlusal treatment in headache patients previously treated by mock occlusal adjustment

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Headache patients who had received mock occlusal adjustment and who, after the placebo treatment, were judged to have moderate to severe mandibular dysfunction were offered further treatment. The present study reports the results of occlusal treatment in 19 patients who were willing to undergo further treatment. Statistically significant reduction after occlusal treatment (occlusal adjustment, aided in some cases by temporary use of occlusal splints) was observed in clinical signs ($P < 0.05$) and subjective symptoms ($P < 0.01$) of mandibular dysfunction and in the frequency of headache ($P < 0.05$). The results are complementary to our earlier clinical studies and corroborate the conclusion that improvements after occlusal treatment exceed those after placebo treatment. □ *Occlusal equilibration; placebo effect; temporomandibular joint syndrome*

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An association between headache and mandibular dysfunction is a rather common finding (for a review, see Ref. 1). It has been suggested that headache should be considered part of the symptom panorama of mandibular dysfunction (2, 3). Uncontrolled studies in dysfunction patients with headache have shown an alleviation of headache after treatment of mandibular dysfunction (4–6). Our previous results for 90 headache patients (7) indicated that occlusal treatment was superior to placebo treatment in reducing the frequency and intensity of headache.

Although occlusal treatment is one of the widely used methods of treatment for mandibular dysfunction, studies on its effectiveness are sparse. Some uncontrolled (8–13) and comparative studies (14–16) suggest that occlusal treatment is effective. Crispin et al. (17), Kopp (18), and Lederman & Clayton (19) have shown occlusal treatment to be superior to non-treatment. In our previous studies on headache patients occlusal treatment was compared with mock occlusal treatment (20). Occlusal treatment was superior to placebo treatment in reducing clinical signs of mandibular dysfunction; however, placebo treatment and occlusal treatment appeared equally effective in reducing subjective symptoms of mandibular dysfunction.

Patients in our placebo group who still had moderate to severe mandibular dysfunction after placebo treatment and were willing to undergo further treatment received occlusal treatment. In the present study the response to occlusal treatment in these patients is reported.

Materials and methods

The subjects in the present study had been admitted to the outpatient department of the Neurological Clinic, Turku University Central Hospital, because of headache. In connection with our earlier study the patients underwent a routine neurologic examination and an examination of the masticatory system (for details see Ref. 21). Two simple cumulative indices were calculated for each patient, to describe the symptoms and clinical signs of mandibular dysfunction. The

indices have been described in detail earlier (22). Patients were randomly assigned to a treatment or placebo group, and after the follow-up period changes in headache and in mandibular dysfunction were assessed by means of a double-blind design (7, 20).

Those patients in the original placebo group who still had moderate to severe mandibular dysfunction were offered further treatment. The patients were not informed about the arrangements of the study or about the nature of the treatment they had received so far. Twenty-three patients were willing to undergo further treatment. All patients had unilateral contacts in retrusion and/or contacts in mediotrusion. Four of them withdrew during the treatment or follow-up period. Three of these had a moderate score and one a high score in the clinical index of mandibular dysfunction. The post-treatment functional state of the masticatory system was thus assessed in 19 patients. The frequency and intensity of headache and the changes in the subjective symptoms of mandibular dysfunction were reassessed in only 18 patients, because 1 patient failed to present for the neurological re-examination.

All patients received occlusal adjustment in accordance with the principles presented by Ramfjord & Ash (23) and by Riise (24). The adjustment was aided by temporary use of occlusal splints in 14 cases (jaw-repositioning splint in 4 cases and full occlusal splint in 10 cases) because of TMJ disc displacement, unstable tooth position, or difficulty in manipulating the mandible into the retruded position. The treatment was given by the researcher who had given the mock treatment. The number of visits ranged from 3 to 6 (mean, 3.6; SD, 0.7). The follow-up period ranged from 5 to 7 months (mean, 6.1; SD, 0.8). After the follow-up period the clinical re-examination of the masticatory system was carried out using the same design as in our earlier study. The neurologic examination was also the same, except that the neurologist was aware of the nature of the treatment given.

The statistical significance of the change in the factors headache and mandibular dysfunction was tested with the Wilcoxon matched-pairs signed-ranks test.

Results

The score of the clinical index of mandibular dysfunction decreased in 13 patients, stayed unchanged in 2 patients, and increased in 4. The median value of the clinical index of mandibular dysfunction was 9 (range, 2–21) before the occlusal treatment and 4 (range, 0–20) after treatment. The decrease was statistically significant ($P < 0.05$) and mostly due to a reduction in the number of tender masticatory muscles, particularly the attachment of the temporalis muscle. The number of joints tender to lateral and posterior palpation also decreased. Joint noises were refractory to treatment and only one disc displacement was succesfully treated.

Statistically significant ($P < 0.01$) improvement was also observed in the subjective symptoms of mandibular dysfunction (Table 1).

Changes in the frequency and intensity of headache after occlusal treatment are presented in Table 2. The decrease in the frequency of headache was significant ($P < 0.05$).

Table 1. Changes in the symptoms of mandibular dysfunction after occlusal treatment

Symptom	Better	Unchanged	Worse
TMJ clickings	5	4	0
TMJ crepitations	1	0	0
TMJ lockings	0	1	0
TMJ luxations	0	1	0
Pain while chewing	3	2	0
Fatigue of the jaw	5	7	0

Table 2. Changes in the frequency and intensity of headache after occlusal treatment ($n = 18$)

Frequency	
Decreased	12
Unchanged	4
Increased	2
Intensity*	
Less severe	5
Unchanged	10
More severe	0

* Information on three patients is missing.

Discussion

In view of the favorable results of our previous clinical study (7, 20), we felt it necessary to offer several patients further treatment, for ethical reasons. As a consequence, the preconditions for patient selection—moderate to severe signs of mandibular dysfunction as judged clinically and willingness to participate—excluded patients in whom substantial improvement in the functional state of the masticatory system did not seem possible. This could be expected to accentuate the effect of occlusal treatment if our hypotheses concerning the interrelationships between occlusal factors, signs of mandibular dysfunction, and headache hold true. If, however, the signs used to describe dysfunction and occlusal interferences are only normal variation, and the commonly used treatment methods, including placebo, are equally efficient, as maintained by Greene & Laskin (25), the change from mock occlusal adjustment to real occlusal treatment could hardly be expected to result in significant improvement in both subjective symptoms and clinical signs.

The effect of the occlusal splints cannot be separated from that of the adjustment in the present study, but our previous studies indicated that the splints were not critical to treatment outcome. The results of Lederman & Clayton (19) also emphasize the importance of occlusal adjustment in achieving a lasting treatment effect.

The median score of the clinical index of mandibular dysfunction decreased significantly after occlusal treatment in the present study, whereas after the placebo treatment (7, 20) it had increased slightly. Despite this, the patients had reported a decrease in the subjective symptoms of mandibular dysfunction, although the decrease was not as marked as that seen in the present study. After placebo treatment some patients had also reported a decrease in the frequency and intensity of headache, but the changes were not statistically significant. In contrast, the decrease in the frequency of headache was statistically significant after occlusal treatment. Thus, although the present study alone does not enable us to draw any definite conclusions as to the efficacy of occlusal treatment in general, it is complementary to our earlier clinical study, corroborating the finding that occlusal treatment (occlusal adjustment, in some cases aided by temporary use of occlusal splints) is superior to placebo treatment in reducing headache and in improving dysfunction.

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