Myofunctional Therapy Combined with Occlusal Splint in Treatment of Temporomandibular Joint Dysfunction-Pain Syndrome

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The objective of the present study was to relate changes in reflex-vegetative functions and phonetics to the etiology of temporomandibular joint dysfunction-pain syndrome. Myofunctional therapy associated with an occlusal splint had a very significant effect in relieving the pain and dysfunction caused by this type of disorder.

Key Words: myotherapy, occlusal splint, temporomandibular joint.

Introduction

Temporomandibular joint (TMJ) dysfunction-pain syndrome has been reported to be due to dental malocclusion (Prentiss, 1918; Costen, 1934; Santos Jr., 1987) and to be associated with psychic factors (Laskin, 1969; Gelb and Bernstein, 1983) and changes in orofacial muscular function (Weinberg, 1979).

Since the initial description by Costen (1934), symptoms such as tinnitus, earache, cervical and facial muscle pain, restriction of oral opening, TMJ clicking or crepitus, cephalæa, dizziness and masticatory difficulties have been confirmed by Ramfjord and Ash (1966) and Gelb and Bernstein (1983) as part of the picture of TMJ dysfunction.

According to Weinberg (1979), a patient who changes his deglutition pattern by placing his tongue between the teeth while swallowing may suffer condylar displacement. In such cases, condylar repositioning should be accompanied by myofunctional treatment. Thus, the objective of the present study was to investigate the relationships between changes in phonetic pattern and in reflex-vegetative functions
(respiration, mastication and deglutition) and the etiology of TMJ dysfunction-pain syndrome.

Material and Methods

A total of 40 patients referred to the Occlusion and Temporomandibular Joint Disorders Service of our Institution with a diagnosis of TMJ dysfunction-pain syndrome were evaluated for possible myofunctional therapy aiming at elimination of reflex-vegetative dysfunction and phonetic correction. Of these, 23 patients were selected for the study, in which the therapeutic indication was an occlusal splint for correction of the condyle-fossa relationship, and for treatment of tooth grinding and other conditions.

The therapeutic proposal is based on the fact that myofunctional equilibrium must be established in order to obtain good dental occlusion and functional TMJ equilibrium.

As part of the treatment, the patients were informed about TMJ dysfunction-pain syndrome and instructed about the procedures to be followed in order to recognize tension points (body regions that become rigid and painful owing to psychic and/or postural problems, with impairment of blood circulation and of toxin elimination) and to learn to control them using relaxing techniques.

Two techniques were used by the patients. The objective of the first is to relax neck and shoulders based on the Wan Reich method (Sandor, 1982). Each step is first demonstrated to the patient, then both patient and instructor sit up straight and execute together the first part of the procedure. In the second part, the patient hears the commands and executes the movements.

The first part of the procedure consists of repeating ten times each of the following steps: 1) with the hands resting on the shoulders, execute forward circular movements with the arms (Figure 1A); 2) repeat the same movement in the opposite (backward) direction; 3) with the arms hanging loose along the body, strongly raise the shoulders and then loosen them (Figure 1B).

In the second part of the procedure, the patient sits straight up, holding his head erect with his eyes closed and repeats each of the following movements five times: 1) stretch the head forward as much as possible, count slowly to five and return very slowly to the initial position (Figure 1C); 2) move the head backwards (Figure 1D); 3) turn the face slowly as if looking to the right, and return slowly to the original position (Figure 2A); 4) turn the face to the left; 5) execute a circular movement with the head (Figure 2B); 6) return to the original position with the eyes still closed, move fingers and toes slowly, stretch, and open the eyes.

The second technique has a general relaxing effect and the patients usually prefer it, also because the time it requires is short. Sitting in the middle part of the seat of a chair, the patient rests his forearms on the middle part of the thighs with his body bent forward. With eyes closed the patient relaxes his head as much as possible and
breathes slowly. The head and trunk will then descend without any effort (Figure 2C). The patient maintains this position for approximately five minutes and then moves each part of the body and straightens up slowly, opening his eyes.

The next step consists of costal-abdominal respiration movements which are first executed lying down, then sitting and finally standing. The patient must: 1) breathe out the air in his lungs, 2) inhale, moving the diaphragm region in the anteroposterior and lateral direction, 3) not move the shoulders or contract the cervical region.
We emphasize nasal respiration because these patients frequently use oral respiration. These are only the basic points of the respiratory technique and the exact sequence can be found in Souza Mello (1984).

We then start working with the orofacial muscles, developing proprioception, tonicity, mobility and motricity in order to obtain adequate patterns of deglutition, mastication, nasal respiration and phonetics, keeping in mind the fact that the equilibrium of the dental arches and of the TMJ depends on the functional equilibrium of the muscles. Thus far we have been using the reeducation techniques described by Padowan (1976), Dias Gomes et al. (1984), Greene (1979) and Altmann (1988). The last two authors specifically deal with treatment of TMJ dysfunction-pain syndrome and patient reeducation after ortognathic surgery, respectively.

We made several adaptations to these techniques such as excluding certain exercises and modifying others, since this is a painful syndrome often involving joint disorders which may be made worse by some of the movements.

We added heat treatment in order to relax the muscles, relieve the pain and provide better mandible mobility. Muscle tension and pain form a vicious cycle which
tends to perpetuate itself and restricts the movements of the mandible. Speech starts to present tense articulation and the patient is afraid to chew, complaining when exercises are prescribed which coincide with movements he has difficulty in executing. We explain to our patients that the exercises will favor the proper movement of each muscle, thus establishing a harmonious relationship between muscles, bones and teeth. For this reason, heat treatment often precedes or accompanies the exercise phase.

_Humid heat_

Warm water compresses are applied to the TMJ and masticatory muscle region for five minutes, after which circular massaging movements are made slowly and with some pressure. This procedure should be repeated four times. Both heat and massage help eliminate the toxins accumulated in the muscles.

_Application of ice_

Although humid heat is more indicated in the literature in cases of TMJ dysfunction-pain syndrome, we use ice in some cases because ice increases the pain threshold and because there are more exteroceptors for cold than warm stimuli (Altmann, 1988). Ice is wrapped in plastic and applied with circular movements to the entire face for ten minutes, producing an analgesic and relaxing effect. The procedure may or may not be followed by massaging with the fingers.

_Phonetics_

Most of the exercises used for functional equilibrium prepare the structures for appropriate phonetic production in terms of place and mode of articulation, since the mechanisms underlying these functions coincide. Thus, some specific phonetic training may be added as a complementary treatment.

_Counter-resistance exercises_

When appropriate function and phonetic patterns are beginning to occur automatically, counter-resistance exercises may be added. These help develop muscle strength and are executed for a few minutes several times a day, but are not indicated during the period of relaxation and/or coordination training.

_Results and Discussion_

In the evaluation of reflex-vegetative function and phonetics in the 40 patients referred to our Institution with complaints of TMJ pain and noise, of facial, cervical and cephalic pain, hearing disorders and others, the following percent changes were
observed: atypical deglutition, 85%; oral and/or mixed respiration, 65%; superior type respiration, 90%; phonetic changes in terms of the place of articulation, 80%; unilateral mastication, 65%; mastication in the incisor region, 5%.

For 23 of these patients, an occlusal splint was prescribed and combined or not with myotherapy for myofunctional reeducation aimed at the elimination of parafunctional habits and development of reflex-vegetative functions. The occlusal splint alone was prescribed for 4 patients, with satisfactory results. For the remaining 19 patients, the splint was prescribed together with myofunctional therapy, but only 14 of them followed both treatments as indicated while 5 used the splint alone. The results are presented in Table 1. The data in the table were analyzed by the exact Fisher test to compare the two treatment conditions, i.e., the 14 patients for whom a splint and myofunctional therapy were prescribed and the 5 patients who received the same prescription but who used only the splint. The test showed that the probability of the two samples being identical was 0.18%, indicating a significant difference at the 1% level. On this basis, we conclude that in the presence of reflex-vegetative and phonetic changes, treatment with the occlusal splint should be associated with myofunctional treatment, since the combined treatment led to resolution of the problem in most cases, while the splint alone did not.

Table 1 - Comparison of the results obtained for patients for whom an occlusal splint plus myotherapy was prescribed and for patients who used only the occlusal splint.

<table>
<thead>
<tr>
<th>Result</th>
<th>Type of treatment</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Splint plus myofunctional therapy</td>
</tr>
<tr>
<td>Resolved</td>
<td>12 cases</td>
</tr>
<tr>
<td>Not resolved</td>
<td>2 cases</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
</tr>
</tbody>
</table>

It should be pointed out that the subjects who followed the combined treatment were able to eliminate the pain-triggering sites and the hearing symptoms, and succeeded in increasing their mandibular movements, with an increase in the degree of mouth opening.

Conclusions

The success of a combination of different treatments, when indicated, leads us to believe that a multidisciplinary approach is the best way to solve the problem,
eliminating both the symptoms and their causes. In the presence of reflex-vegetative and phonetic changes, treatment with an occlusal splint should be combined with myofunctional therapy, an association that led to resolution of most of the present cases.

Classical myofunctional reeducation by a phonoaudiologist as part of the treatment of TMJ dysfunction-pain syndrome was the first step which should be followed by the investigation of additional types of exercise.

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