Comparison of the Clinical Features of TMD Patients and their Treatment Outcomes between Prosthodontic and TMD Clinics

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Abstract

Purpose: We conducted this study in order to define the methods of treatment that are beneficial for TMD patients by the comparison of the characteristics of TMD patients between prosthodontic clinic (PD-C) and special clinics for TMD (TMD-C).

Methods: Clinical records that had been preserved in a database of 253 new TMD patients treated in PD-C were compared with 404 new TMD patients treated in TMD-C. Items of sex, age, chief complaint, present observations, diagnostic categories, treatment methods and treatment outcome were investigated. The chi-square test was used for comparison of the items in two groups (StatMateIII for Windows).

Results: The TMD patients in both groups were characterized as being a high female-to-male ratio. Most symptoms were pain of TMJ and masticatory muscles as the chief complaint and present observations. According to the diagnostic categories, there were the most Type I conditions (masticatory muscle disorders) in PD-C and the most Type III conditions (disc disorders) in TMD-C. Treatment consisted of mostly splint therapy (81%) in PD-C, and patient education (67%) and physiotherapy (64%) in TMD-C. Thirty percent of the patients in PD-C and 42% of those in TMD-C were completely healed, thus showing that the treatment outcome of TMD-C was superior.

Conclusion: We reached the conclusions that the treatment outcome of TMD patients was superior, as we provided patient education such as prohibition of tooth contact and orofacial parafunctions, and physiotherapy such as jaw opening stretches. Clinicians who treat TMD patients should choose patient education and physiotherapy as their first approach.

Key words: temporomandibular disorder, diagnostic categories, splint therapy, patient education, physiotherapy

Introduction

In Showa University Dental Hospital, firstly the Department of Oral and Maxillofacial Surgery examine patients with temporomandibular disorders (TMD) and then they refer TMD patients with ambiguous occlusal problems to a prosthodontist. Many prosthodontists, therefore, have provided splint therapy in the Prosthodontic clinic (PD-C). Consequently, in our hospital, many TMD patients have been treated with occlusal splint therapy, and it is considered that splint therapy is an effective treatment. However this treatment’s effectiveness is not well documented. In September 2004, the special clinic of TMD (TMD-C) was established in Showa University Dental Hospital and the therapeutic system has been changed because the number of TMD patients has increased. We began to provide conser-
Comparison of TMD Patients between Prosthodontic and TMD Clinics

Conservative therapy (patient education, physiotherapy, drug therapy and splint therapy) in order to respond to greater risk factors in our TMD-C. It was the purpose of the present study to compare characteristics of TMD patients between PD-C and TMD-C, and to choose beneficial treatment methods in TMD patients.

Materials and methods

Clinical records that had been preserved in a database of 253 new patients who visited for treatment of TMD to PD-C during a period of 5 years (from January 1991 to December 1995) were compared with those of 404 new patients who visited TMD-C during a period of 1 year (from September 2004 to August 2005). We investigated items of sex, age, chief complaint, present observations, diagnostic categories (5 types based on a new classification proposal advocated by the Japanese Society of Temporomandibular Joint in 2001.), treatment methods and treatment outcome. The chi-square test was used for comparison of the items in two groups (StatMate III for Windows, ATMS, JAPAN).

Results

Eighty-five percent of the patients were female in PD-C and 74% in TMD-C, with a statistically significant difference ($P<0.01$) between the groups (Fig. 1).

The twenties age group accounted for 28% of all patients in PD-C and 23% for those of the 20's age group in TMD-C. The results for all of the patients were shown in Figure 2. The significant difference was found between the groups ($P<0.05$).

Fifty-five percent of the patients in PD-C and 69% of the patients in TMD-C reported pain for a chief complaint. Forty-three percent of the patients in PD-C and 24% in TMD-C reported TMJ noise for a chief complaint. Twenty-four percent of the patients in PD-C and 28% of the patients in TMD-C reported trismus (mouth-opening distance < 40 mm) for a chief complaint. Twenty-eight percent of the patients in PD-C and 23% of the patients in TMD-C reported other symptoms (ear symptoms, headache, occlusal discomfort, etc.) $\chi^2$ test was used to determine significance. ***$P<0.001$.

Sixty-seven percent of the patients in PD-C and 81% of the patients in TMD-C had pain for present observations. Sixty percent of the patients in PD-C and 53% of the patients in TMD-C had TMJ noise for present observations. Thirty-four percent of the patients in PD-C and 46% of the patients in TMD-C had a mouth-opening distance < 40 mm for present observations. Twenty per-
cent of the patients in PD-C and 36% of the patients in TMD-C had other symptoms for present observations. The difference between the groups was statistically significant ($P<0.01$, Fig. 4).

According to diagnostic categories that were classified by Japanese Society for the Temporomandibular Joint, 34% of the patients were classified as being Type I conditions (masticatory muscle disorders), 18% as Type II conditions (capsule-ligament disorders), 10% as Type IIIa conditions (disc disorders with reduction), 8% as Type IIIb conditions (disc disorders without reduction), 17% as Type IV conditions (degenerative joint disorders) and 13% as Type V (the exclusion of Type I-IV) in PD-C, and 18% of the patients as Type I, 37% as Type IIIa, 20% as Type IIIb, 10% as Type IV and 6% as Type V in TMD-C. The difference between the groups was statistically significant ($p<0.001$, Fig. 5).

Treatment consisted of splint therapy (81%) and occlusal therapy (47%) in PD-C, and patient education (67%), physiotherapy (64%), drug therapy (28%) and splint therapy (26%) in TMD-C. The difference between the groups was statistically significant ($**P<0.01$, Fig. 6).

Thirty percent of the patients in PD-C and 42% of those in TMD-C were completely healed, 35% of those in PD-C and 34% of those in TMD-C were effectively improved, 15% of those in PD-C and 16% of those in TMD-C discontinued treatment, 4% of those in PD-C and 1% of those in TMD-C were not improved and 16% of those in PD-C and 7% of those in TMD-C were not treated. The difference of treatment outcomes between the groups was statistically significant ($***P<0.001$, Fig. 7).

Discussion

The TMD patients seeking treatment in both PD-C and TMD-C groups were characterized as being a high female-to-male ratio. The patients composed of 85% women in PD-C are particularly similar to the national clinical sample of 85.1% that were evaluated for TMD with more than 10,000 patients.\textsuperscript{1} Although the estrogen and progesterone receptors in the articular cartilage were found in more of the women with
TMJ symptoms than the women without TMJ symptoms and men, it was not concluded that female sex hormones and TMJ symptoms correlated to each other. In modern times, males may handle their stress more easily than females, although the TMD patients reported a higher level of severity of psychological symptoms and self-reported emotional tension demonstrated strong associations with TMD.

Most symptoms were pain of TMJ and masticatory muscles as the chief complaint and present observations. Since many adults in the civilian population without clinical symptoms experienced orofacial pain more than once during the past six months, it is important to improve an acute or chronic pain of the patients with TMD seeking treatment.

There were the most Type I conditions (masticatory muscle disorders) with 34% and few Type III conditions (disc disorders) with 18% in PD-C because it was thought that there were many patients who had occlusal problems in PD-C and their masticatory muscles were influenced directly or indirectly by occlusal problems. On the other hand, there were the most Type III with 57% and Type I with 18% in TMD-C; we found significant difference between the groups. Therefore, it was also thought that there were a lot of patients in TMD-C who had daily bad habits and/or oral parafunctional movements that had influence, directly or indirectly, on TMJ.

We considered that there were many TMD patients who were diagnosed as having an occlusion in the onset of TMD by oral and maxillofacial surgeons. Therefore, splint therapy accounted for 81% in PD-C, being a higher rate than in TMD-C. In addition, it was thought that many patients had occlusal problems because irreversible occlusal treatment showed 47% in PD-C. Fourteen studies of splint therapy met the inclusion criteria by a qualitative systematic review of randomized controlled trials (RCT) of occlusal treatment studies from the period 1966 to March 1999. Splint therapy was found superior to 3, and comparable to 12 control treatments, and superior or comparable to 4 passive controls, respectively. There is an obvious need for well designed controlled studies, therefore, as the use of occlusal splints may be of some benefit in the treatment of TMD. It was good that the splint therapy has been used for the TMD patients who sought to improve symptoms of TMD and visited in PD-C. When there were occlusal problems (occlusal interferences for example) influenced to the onset of TMD, it may be said that it was a matter of course that efficacy of splint therapy was demonstrated. There is a pro and con about the effect of the treatment of splint therapy because it was not completely understood. It was reported that the subjects were not provided counseling of any sort of therapy during the trial period, and occlusal splint, regardless of the type of guidance, were superior to the non-occluding splint on the pain reduction in a double-blind, controlled randomized clinical trial for six months. The short-term efficacy of a stabilization appliance in TMD patients of arthrogenous origin was evaluated using a randomized, controlled, and double-blind design for ten weeks. Overall subjective symptoms were improved significantly more often in the treatment group given a stabilization appliance than the control group given a non-occlusal appliance. On the contrary, the short-term results showed that at six weeks there were no significant differences between stabilizing splints and non-occluding control splints for any of the selected outcome measures in general dental practice. In the controlled trial study that compared the long-term effects of treatment with a stabilization appliance, treatment with a controlled non-occlusal appliance and treatment with first a
controlled non-occlusal appliance and then a stabilization appliance in TMD patients, a significant decrease in signs and symptoms was found in groups using a stabilization appliance at the 6 and 12 month follow-ups. However, when TMD outcomes in general dental practice one year after treatment with stabilizing splints and non-occluding control splints were evaluated, there were no significant differences of improvements after initial treatment between both groups. In the above-mentioned, there were some studies that showed no significant difference between the stabilization appliance group and non-occlusal appliance group and other studies that showed the stabilization appliance group was more effective than non-occlusal appliance group. Therefore, it was difficult that we discussed the efficacy of appliance therapy. As TMD patients were completely healed for 30% and effectively improved for 35% using splint therapy in PD-C, it was thought that splint therapy can be recommended, especially when an underlying occlusal problem is suspected, and when patients do not show a response to other educational or physical treatment. It is important to be given the information that the load to TMJ and the tension of the masticatory muscles will reduce in nocturnal clenching and/or grinding when patients wear a stabilization appliance. In other words, patient education is already performed to relax stomatognathic tension. The RCT study was designed to compare usual conservative, dentist-prescribed self-care treatment including jaw relaxation and passive opening stretches without any intraoral splint appliance, self-care treatment plus a conventional flat-plane hard acrylic splint and self-care treatment plus a soft vinyl splint. There were no significant differences between the groups in TMD-related pain levels or other common signs and symptoms of TMD at baseline or at 3, 6 and 12 month follow-ups. This finding suggested that splint therapy did not provide a greater benefit than self-care treatment alone. On the other hand, patient education was prescribed to patients with TMD of 67% in TMD-C. It was the correction of teeth contacting habit (TCH) that this patient education played a key role. TCH was found in 52.4% of patients with pain lasting for more than four months. TCH could prolong TMD pain and was associated with other behavioral factors. In this study, a presence rate of TCH was definitely not seen, but, as many patients were prescribed patient education, it was thought that TCH was associated with the onset of TMD and the worse factor of TMD symptoms. Physical therapy showed 64%, and it was thought that we paid attention to the positive moving of articular disc and extending of jaw closing muscles.

In the treatment outcome of this study, the TMD patients were completely healed for 30% and effectively improved for 35% in PD-C and were completely healed for 42% and effectively improved for 34% in TMD-C; the results of treatment outcome of TMD-C were superior. As for these results, it was thought that we gave patient education such as correction of TCH and/or physical therapy such as mouth opening exercise in initial treatment of TMD-C whereas splint therapy mainly was provided in PD-C. In the previous study, there were many patients who did not realize that they had TCH and/or who thought it was normal to have contact between their upper and lower teeth continuously. In this study, therefore, we guessed that reduction of TMD symptoms, shortening of a treatment period and superiority of treatment outcome occurred by prescribing correction of TCH. The study that evaluated the effectiveness of a treatment regimen comprising of counseling and physical therapy in patients with myofascial pain of the masticatory system for 4 weeks or 6 weeks at baseline, 2, 4 and 6 week follow ups suggested that counseling and physical therapy resulted in significant improvement in parameters of pain and jaw function regardless of 4 weeks versus 6 weeks of physical therapy. Patients were counseled that their teeth should never touch when the jaw is at rest. In addition, they were taught that their masseter muscle should stretch. The correction of TCH and the mouth opening exercise were introduced definitely. It was thought that a controlled study will be necessary to elucidate the specific effectiveness of counseling or physical therapy. The results of the study that compared the short-term efficacy of patient education only versus the combination of patient education and home exercises for the treatment of myofascial pain of the jaw muscles for 3 months in RCT indicated that the combination therapy was slightly more clinically effective than education alone. Patient education (correction of TCH) and physical therapy were almost taken at the same percentage in TMD-C, and it was thought that this contributed to a superior treatment outcome. It seemed that therapies such as “correction of TCH” and “mouth
opening exercise” were effective in treatment of the TMD patients.

**Conclusion**

We reached the conclusions that the treatment outcome of TMD patients was superior, as we provided patient education such as prohibition of tooth contact and orofacial parafunctions and physiotherapy such as jaw opening stretch. We should give a low cost therapy such as patient education and physical therapy for initial treatment of the TMD patients, and it was thought that it was desirable to use splint therapy together when we considered occlusal problems.

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**References**