Temporomandibular disorders (TMD), or craniomandibular disorders (CMD), is a collective term used to describe a group of cranio-orofacial conditions that are differentiated as pain or noise in the mastication muscles or temporomandibular joints (TMJ) and limited mandibular function. TMD pain can simulate atypical facial pain (AFP) with characteristics of pain ranging from unilateral, bilateral, or migratory. More than 10 million people in the United States suffer from TMD. The average age of onset is between 18 and 26 years, and women are 5 times more susceptible than men. Studies indicate that very old people who exhibit objective symptoms of TMD do not complain of pain, whereas younger subjects who do not have any objective signs of TMD complain of severe pain. Only 5% to 15% of these sufferers seek any kind of treatment. It is estimated that approximately $30 billion worth of productivity and more than 550 million work days are lost each year due to this health problem.

The National Institute of Dental and Craniofacial Research (NIDCR), a branch of the National Institutes of Health (NIH), classifies TMD into 3 main categories: myofascial pain, the most common form of TMD, which is discomfort or pain in the muscles that control jaw function and the neck and shoulder muscles; internal derangement of the joint, meaning a dislocated jaw or displaced disc or injury to the condyle; and degenerative joint disease, such as osteoarthritis or rheumatoid arthritis in the jaw joint. A person can have one or more of these conditions at the same time. Among young women reporting facial pain, clinical TMD subtypes (Axis I and Axis II), pain impact, treatment utilization, and additional characteristics other than somatization with pain were similar among Caucasians and African Americans. In a high percentage of these non-clinical cases, the young people presented with severe depression and somatization.

The etiology and pathophysiology of chronic TMD is still obscure. Nevertheless, stress, bruxism (teeth grinding), degenerative joint disease (arthritis), trauma, or a displaced disk between the upper and lower bones of the TMJ have been considered to be responsible for the development of symptoms of TMD. A detailed history and comprehensive clinical exam determine an individual’s combination of causative factors. There could be a variety of symptoms of TMD, but pain in the TMJ and the masticator muscles is the most common symptom. Headaches, facial pain, tinnitus, clicking or popping of the jaw, locking of the jaw, and limited mouth motions are other symptoms associated with TMD. In some cases, dizziness, neck pain, sensitive teeth, and hearing problems are also present.

Treatment for TMD is determined based on age, overall health, medical history, and duration and severity of the disease. The goals of treatment are to restore normal function of the mandible by eliminating pain and clicking. Treatment options are classified into reversible and irreversible. Unlike irreversible treatments, reversible treatments do not cause permanent changes in the structure or position of the jaw. These include resting the TMJ, medication and/or pain relievers, intra-articular injections, relaxation techniques, stress management, behavior modification, spinal manipulation, physical therapy, an oral splint to reduce bruxism, posture training, diet modification, ice, and hot packs. Surgery and orthodontic measures are examples of irreversible treatments. The NIDCR advises TMD sufferers to avoid surgery if possible because the risks outweigh the benefits. Surgical treatments that involve replacement of TMJ with artificial implants may cause severe pain and permanent jaw damage.

The use of complementary and alternative medicine (CAM) for TMD is steadily growing and seems to be preferred over invasive conventional care. Acupuncture, chiropractic, and massage were most frequently accessed and reported as helpful by participants in a study conducted by the Oregon Center for Complementary and Alternative Medicine (OCCAM) to determine willingness of TMD patients to join a CAM research study. In another survey conducted by Raphael et al, it was reported that of the 63 women with myofascial TMD, 22.2% of participants used CAM treatment for their pain, even prior to an initial treatment with an intraoral splint. The survey also reports that medication (28.6%) was the only single type of treatment more commonly used than CAM treatment. Relaxation therapy (12.7%) was the
most common type of CAM treatment the participants used, followed by chiropractic treatment (9.5%). More than half did not use any type of treatment. A similar survey reported that those using CAM for TMD tended to be older, had a history of multiple medical problems, and reported more positive psychological functioning. Respondents who most often reported CAM treatment as “very helpful” for their TMD were likely to be healthier.

Chiropractic traditionally has applied motion routine analysis when investigating the spine or extremities. A similar method of motion analysis of mandibular gait by chiropractors would facilitate diagnosis of abnormality in mandibular range of motion, assisting in treatment of TMD using chiropractic manipulative therapy (CMT). Moreover, localized inflammatory conditions such as capsulitis and synovitis are commonly treated by chiropractors in day-to-day practice, yet research on chiropractic use in TMD treatment is limited. In a prospective case series published in the Journal of Manipulative and Physiological Therapeutics in September 2003, Devocht et al reported that chiropractic treatment, when given 3 times per week for 2 weeks using the activator adjusting instrument, showed improvement in TMD symptoms. Similar positive findings were reported by other authors who had examined chiropractic treatments in many supplementary TMD case studies. These reports have not adequately demonstrated their safety or efficacy; therefore, there is a need for controlled clinical trials to evaluate the utility of chiropractic treatments for TMD. This study is a preliminary step in investigating the effectiveness of pragmatic chiropractic treatments in relieving the symptoms of TMD using standardized scales.

METHODS

Study Sample

The data presented here is from a structured (experimental) case series. Seven participants were from the greater Los Angeles area who either self-referred in response to flyers and newspaper ads or were referred by physicians participated in this study between January 2002 and December 2002. All 7 participants qualified for the study based on standard eligibility criteria. A written informed consent was obtained from all the participants. The participants were then clinically screened by a licensed chiropractor and were either included or excluded based on the following criteria:

- Patient must be 18 years of age or older.
- Patient must have chronic recurrent jaw pain greater than 6 months.
- Patient must have decreased range of motion (ROM) of mandible.
- Patient must have joint sounds (crepitus, pop, click) present.
- Patient must have deviation in mandibular path.
- Patient must have pain on palpation of TMJ and masticator muscles.
- Patient must have difficulty chewing or swallowing.
- Patient must have history of headaches.
- Patient must not have serious medical problems (eg, advanced cancer, heart failure, etc; any medical condition in advanced stage/state of exacerbation, which causes unrelenting pain or which interferes with patient’s ability to perform a walk test).
- Patient must not have obvious psychological disorders.
- Patient must not be involved in litigation.
- Patient must not have had intra-articular corticosteroid injection into the jaw area within 4 weeks immediately preceding entry to study.
- Patient must not have history or clinical indications of bleeding diathesis (eg, hemophilia, thrombocytopenia, etc), including current use of anti-coagulants (eg, heparin, warfarin, anisindione).
- Patient must not currently use hypertensive and/or cardiac regulatory medication (eg, diltiazem).

Study Intervention

All the participants received pragmatic chiropractic treatment that included CMT, myofascial release technique (MRT), activator adjustments, hot and ice packs, and soft tissue massage. Diet, lifestyle advice, and some exercises of the jaw that would help reduce pain and discomfort also were part of the treatment given by the chiropractors. All participants were treated for 8 weeks, but the frequency and type of treatment was determined by the treating chiropractor based on the individual complaints and needs. The protocol and the informed consent were approved by the Southern California University of Health Sciences Institutional Review Board.

Outcome Measures

The following outcome measures were used to assess the effectiveness of chiropractic treatment: (1) Medical Outcomes Study 12-Item Short Form Health Survey (SF-12) and (2) visual analog scale (VAS). Both the measures are standardized and have been used in other studies. The VAS collected information about the current state of symptoms as well as the previous week's symptom scale. It had 7 items, which included severity of TMJ pain now, least severe pain, most severe pain in the previous week, current mood state, the pain interference in daily activities, frequency of pain in the past week, and finally the confidence participants had in the present treatment.

Data Collection

A research manager who was not directly involved in treatment collected the data; however, this person was not blinded. Scores for the above listed outcome measures were taken at baseline and at the 1-month and 2-month points in the study. In addition, patients were asked to fill out an adverse events/notification form, if necessary. There were no adverse events reported, except mild soreness that was reported by some of the participants on the day following treatment. This was considered normal after chiropractic adjustment, and no treatment was given.

RESULTS

The study sample consisted of 6 females and 1 male. The mean age was 35.71 years, range 22 to 52, SD ±10.78. Six out of 7
items in the VAS showed improvement at the end of 2 months of treatment. Table 1 shows that severity of pain decreased from a baseline mean value of 3.42 to 0.57 at the end of 2 months. There was an overall 83% change in severity of pain at the end of 2 months. Least severe pain was 2.71 mean value at baseline, and it decreased to 0.57 at the end of 2 months (79% change). Similarly, most severe pain decreased from 4.85 to 2.71 (44% change); pain interference with activities decreased from a mean value of 3.85 to 2.14 (44% change); poor mood state had a mean value of 2.85 at baseline and decreased to 1.57 at the end of 2 months (45%); frequency of symptoms decreased from a baseline mean value of 3 to 2 at the end of treatment. Confidence in treatment was the same at baseline and at the end of treatment (mean value 8.28).

Table 2 reports SF-12 measures at baseline, at 1 month, and at the end of 2 months. The percentages of change between mean baseline values (B) and end of treatment (EoT) mean values of all the individual items of SF-12 show an overall improvement in all the items, although most of them are moderate. General health (B: 2.85-EoT: 3.14, 10% change), mental health (B: 3-EoT: 3.71, 24%), and energy scales (B: 2.71-EoT: 2.85, 5%) improved with time. Participants’ physical health (B: 0.57-EoT: 0.85, 49%) and emotional health status (B: 0.42-EoT: 0.71, 69%) also improved. Pain interference in normal activities (B: 2.42-EoT: 3.42, 41%) and in social activities (B: 3.57-EoT: 4.14, 16%) also showed improvement. Both moderate activity (B: 1.28-EoT: 1.42, 11%) and excess activity (B: 1.28-EoT: 1.85, 44%) levels of the participants improved over time.

Table 1 shows the mean values of Visual Analog (VAS) scale measures with percentage of change.

**DISCUSSION**

TMD manifests in many forms and degrees of severity. It rarely has a single cause. As a result, treatment is varied and each patient treatment is dependent upon the uniqueness of the patient’s symptoms and the etiology. Thus, chiropractic treatment in a clinical setting often is individualized according to the duration, severity, and cause of a particular condition. The objective of this study was to investigate whether pragmatic chiropractic treatment can relieve the symptoms of TMD and improve the overall health of a small number of patients.

The VAS measures indicate that all items except confidence in treatment had a positive change (Figure). All participants had a high level of confidence (8.28 out of 10) at baseline and continued at the same level (mean 8.28) throughout treatment. So there was neither a loss nor a gain in confidence levels. Scores of “severest pain now” and “least severe symptoms last week” showed a more positive impact than other scales.

SF-12 measures indicated that there was an overall improvement in general and mental health, in addition to reduction in pain interference for both normal and social activities. Participants accomplished more at the end of treatment due to improvement in physical and emotional health.

The positive changes in both the physical and psychological parameters in both scales indicate that the individualized holistic approach adopted by the chiropractors could have helped reduce the symptoms of TMD in this sample. Moreover, no adverse events were reported by the participants throughout the study. There are several limitations in this study. First, there is no control group with which to compare the results; therefore, the improvements noted in this study cannot prove a cause-and-effect relationship between the treatments given and the improvements in these subjects, which could have been the result of other factors. Second, we did not collect follow-up data and therefore the long-term effects of these improvements are not known. Third, the 7-item VAS has not been tested for its validity and reliability for TMD disorders.

**CONCLUSION**

Pragmatic chiropractic treatment was found to be relatively effective and safe in the treatment of mild to moderate TMD.
These data encouraged the research team to pursue further investigation of usefulness of chiropractic in the treatment of TMD. The research team intends to use these data to plan more rigorous trials such as quasi-experimental and randomized controlled trials using a larger sample. We also plan to collect follow-up data to determine whether there is any decay in improvement. Additional standardized scales specifically focused on TMD symptoms will be utilized in subsequent trials.

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REFERENCES


