Characteristics of 511 patients with temporomandibular disorders referred for physical therapy

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Objective. This study aimed (1) to identify the diagnostic subsets of a patient population with temporomandibular disorders (TMD) referred from dental professionals to a physical therapist (PT) in an outpatient physical therapy practice and (2) to use the characteristics of this TMD population to assist clinical decision making in the management of TMD.
Study Design. This was an institutional review board–approved, retrospective study of 511 patients referred to a PT. The PT followed the diagnostic guidelines of axis I of the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD).
Results. All 8 diagnostic subsets of the RDC/TMD were diagnosed among the 511 patients. Concurrent diagnostic subsets, cervical spine involvement, and oral appliance use were described.
Conclusions. PTs in an outpatient practice should be proficient in the use of the RDC/TMD. Characteristics identified with this patient population suggest that dentists should involve the services of PTs early in the management of patients with TMD and cervical symptoms. (Oral Surg Oral Med Oral Pathol Oral Radiol 2014;118:432-439)

Temporomandibular disorders (TMD) are various clinical conditions that involve the temporomandibular joint (TMJ), masticatory muscles, and associated tissues.[1] TMD may manifest as pain in the temporomandibular region, limitations in jaw motion, and TMJ sounds such as clicking or crepitus with movement.[1] TMD have a prevalence of 8% to 15% in the adult population, affecting women more frequently than men.[2] The risk of TMD increases with age, with the peak prevalence around 35 to 45 years, and TMD ranks only second to low back pain in the United States as a prevalent musculoskeletal problem, with treatment costing an average of US $4 billion dollars annually.[3,4] Conservative, reversible, and cost-effective treatments are recommended for most patients with acute or chronic TMD pain and dysfunction.[1] Although surgery for disk displacement was at one time more prevalent, it is now often considered only after evidence-based conservative care has failed. Conservative care includes oral appliance therapy, pharmacologic management, behavioral modification, and physical therapy.[1] In the management of TMD, none of the aforementioned conservative treatments has been found to be more effective than others in achieving a positive outcome. The clinician may decide which treatment to offer based on personal bias, ease of providing the treatment, scientific evidence, the cost of treatment, the potential complications, or some combination of those. Regardless of the reasoning behind the treatment choice, the decision should be based on accurate diagnoses.

Although the numbers are improving, many practicing dentists, physicians, and physical therapists (PTs) are not formally trained in the diagnosis and treatment of TMD.[5,6] A recent survey of US and Canadian dental schools found that only 66% to 75% of programs taught the skills necessary to perform a proper TMD examination.[7] In the dental schools where TMD management was taught, it was likely that the information provided may have been based on personal bias and not on scientific evidence.[7] It is estimated that physicians may get only 1 lecture on the evaluation and diagnosis of TMD throughout their formal education.[8] Information pertaining to the clinical and academic content received by PTs regarding TMD from the approximately 212 accredited programs in the United States is not available. Anecdotal evidence suggests physical therapy students may average less than 3 hours of education on TMD in the university setting. Patients with TMD, if misdiagnosed or untreated, may develop a chronic pain condition potentially resulting in days lost at work, lifestyle disturbances, increased cost to the health care system, and psychosocial magnification and central sensitization.[1,4,9]

Statement of Clinical Relevance

Physical therapists should be proficient in using the Research Diagnostic Criteria for Temporomandibular Disorders. Characteristics identified with this patient population suggest that dentists should involve the services of physical therapists in the management of patients with temporomandibular disorders and cervical symptoms.

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The majority of patients with TMD referred to PTs for treatment are referred by dentists. To date, there has not been any systematic examination of the application of the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) to patients referred by dental professionals to a PT. The first aim of this study was to determine whether a PT in an outpatient physical therapy practice can incorporate the RDC/TMD into an upper-quarter examination for the purpose of gathering clinical data on the TMD diagnostic subsets of patients referred by dentists. The second aim of this study was to evaluate how the characteristics of this TMD population could be used to inform clinical practice by PTs and dental professionals in the management of TMD.

METHODS

This was an institutional review board–approved, retrospective study with signed consent from each patient. The process used to diagnose the diagnostic subsets of TMD followed axis I of the 1992 RDC/TMD guidelines.[10] At the time of this study, RDC/TMD used ≤35 mm of interincisal opening, which includes correction for vertical incisal overlap to represent limited mouth opening. This study used ≤30 mm of interincisal opening without correction of vertical incisal overlap to represent limited mouth opening. Not correcting for vertical incisal overlap reduces reliability concerns.[11]

Consecutive new patients were evaluated from the periods of April 30, 2007, through April 4, 2008, and October 31, 2008, through May 6, 2009. Before the examination, all patients completed a medical history questionnaire, symptom questionnaire, and a symptom location diagram. All patients were evaluated by the author using the diagnostic criteria of axis I of the RDC/TMD. Evaluation findings of the RDC/TMD guided the author in treatment decisions and modifications of subsequent treatments based on the reassessment of the patient's condition using the RDC/TMD. All aspects of patient care, consisting of the evaluation, treatments, and ultimately discharge of the patient, were done by the author, who is referred to as the clinical examiner (CE).

Inclusion criteria

A total of 579 patients were referred to the CE during the time of data collection. The inclusion criteria for this study were as follows:

1. Patients had to be referred to the physical therapy practice by a dentist.
2. Patients could not have symptoms arising from active pathology of the head, face, jaw, or dentition.
3. Patients had to be able to complete a medical history questionnaire, a symptom questionnaire, and a symptom location diagram questionnaire, and they had to respond to verbal questions during the examination without assistance.

Inclusion criterion 1. Of the 579 patients, 63 did not meet criterion 1 because they were referred to the CE by a physician. The remaining 516 patients were referred by members of the dental profession.

Inclusion criterion 2. Of the remaining 516 patients, 3 were omitted from this study because they did not meet criterion 2. After consulting with the referring dentist and with further testing, these 3 patients were excluded owing to cancer of the nasopharyngeal space, a blockage of a parotid gland duct, and a cracked tooth, respectively.

Inclusion criterion 3. Of the remaining 513 patients, 2 did not meet inclusion criterion 3. One patient was mentally challenged and the other had been diagnosed with Alzheimer's disease. These 2 patients were unable to complete the necessary forms and were omitted from this study.

RESULTS

A total of 511 patients met the inclusion criteria. The patients were referred by 65 dentists; 424 of the 511 patients were referred by 49 practitioners of various dental specialties. The remaining 87 patients were referred by 16 oral surgeons. There were 401 white patients, 63 African American patients, 8 Hispanic patients, and 39 patients of other ethnicities. The average age of this population was 43.9 years, with a female-to-male ratio of 5:1. The 422 women had an average age of 44.9, and the 89 men had an average age of 43.7. Marital status was reported as follows: 276, married; 148, never married; 42, divorced; 10, widowed; and 35, no response. A majority of the patients (357) had at least some college or other higher education.

Reasons for why a dentist referred a patient to the PT varied. Reasons for referral included the following:

- The patient's symptoms were not responding to dental intervention such as an oral appliance or occlusal equilibration.
- The patient's symptoms needed to be resolved before dental intervention (such as orthodontic treatment or occlusal equilibration) was initiated.
- If surgical intervention to the TMJ was being considered, the dentist wanted to determine how many of the patient's symptoms were myogenous vs arthrogenous.
- The patient had been evaluated and treated by a number of other health care professionals (primary care physician, otolaryngologist, neurologist, rheumatologist) with no resolution of the symptoms.
- The patient developed symptoms secondary to dental intervention (e.g., the dental procedure was

Table I. Diagnostic subsets of TMD among 511 patients

	Groups	*Total patients*	*Right*	*Left*	*Bilaterally*
Group I	Myofascial pain	427			
	Ia. Myofascial pain without limited opening	321			
	188, masseter; 3, temporalis; 130, masseter & temporalis				
	Masseter	318	30	57	231
	Temporalis	133	11	14	108
	Ib. Myofascial pain with limited opening (≤30 mm)	106			
	72, masseter; 0, temporalis; 34, masseter & temporalis				
	Masseter	106	28	23	55
	Temporalis	34	7	6	21
Group II	Disk displacements	199			
	IIa. Disk displacement with reduction	88	31	37	20
	IIb. Disk displacement without reduction with limited opening (≤30 mm)	70	30	34	6
	IIc. Disk displacement without reduction without limited opening (>30 mm)	41	14	19	8
Group III	IIIa. TMJ arthralgia	240	77	81	82
	IIIb. Osteoarthritis	24	11	7	6
	IIIc. Osteoarthrosis	25	10	11	4

TMD, temporomandibular disorders; *TMJ*, temporomandibular joint.

prolonged or multiple injections were required to obtain local dental anesthesia).

- This was the routine practice of the dentist (i.e., to determine if physical therapy can manage the patient's symptoms without any dental intervention).

Although all patients in this study were accompanied by a written referral with a diagnosis, only a small percentage (10%) had a formal diagnosis of TMD (i.e., disk displacement without reduction or arthralgia). The majority of the referrals stated "evaluate and treat," whereas others had a radiologic diagnosis or a vague physiopathologic or anatomic diagnosis such as ligamentitis, joint hypomobility of the TMJ, occlusal dysfunction, flattening of the condyle, distress of the TMJ, myofascial restriction, muscle spasm, muscle splinting, open lock, close lock, hyperflexed jaw, or clenching with pain.

The 3 groups of the RDC/TMD and all diagnostic subsets for each group were diagnosed among the 511 patients (Table I), with many patients having 1 of more other diagnostic subsets of TMD. (Figure 1). Group I (muscle disorders) had the largest number of patients; 84% of the patient population (427 of 511) had myofascial pain, with or without limited mouth opening. Group II (disk displacements) was the smallest group with 39% (199 of 511). The second-largest group was group III, which included 57% (289 of 511) of the patients; these were patients with diagnoses of arthralgia, osteoarthrosis, or osteoarthritis.

The onset of symptoms varied among the 511 patents. The majority of the patient population, 72% (368 of 511), had an insidious onset of symptoms. The remaining 28% (143 of 511) of patients had a specific event contributing to their symptoms. Trauma, but not directly to the jaw, was the cause of onset for 5% (23 of 511) of the patients; direct trauma to the jaw was the cause of onset for 6% (31 of 511) of the patients. An iatrogenic onset (intraoral injection or prolonged dental procedure) was the cause of onset of symptoms in 6% (26 of 511) of the patients, and 12% (63 of 511) had postoperative symptoms. TMJ surgical procedures consisted of arthrocentesis, arthroscopy, and arthroplasty, with several patients having had reconstructive surgery for mandibular/maxillary fractures.

Duration of symptoms was divided into acute (≤3 months) and chronic (>3 months). Acute symptoms were reported by 27% (138 of 511) of the patients, whereas chronic symptoms were reported by 73% (373 of 511). The average duration of chronic symptoms was 4.4 years.

Before examination by the PT, the 511 patients consulted with 1642 health care professionals, for an average of 3.2 health care professionals per patient. Patients within this study saw 805 dentists (including the referring dentists), for an average of 1.6 dentists per patient; 203 patients had visits with their primary care physician; and 139 patients saw 144 otorhinolaryngologists. The remaining 490 health care professionals included neurologists, pain specialists, orthopedists, rheumatologists, psychologists, and others. A panoramic radiograph was taken for 72% of the patients (362 of 511), and 100 of these 362 patients had magnetic resonance imaging (MRI) of their TMJs.

A majority of patients in this study presented with 1 or more symptoms; jaw-related symptoms were reported by 96% of the patient population. Jaw symptoms included pain (65%), limited mouth opening (62%), popping (47%), and locking (24%). The second largest group of symptoms reported by the 511 patients was neck pain, which involved 69% of patients (315 of 511). Of those with neck pain, 74% said that they were bothered by headaches that were concurrent with their neck pain. The remaining symptoms consisted of

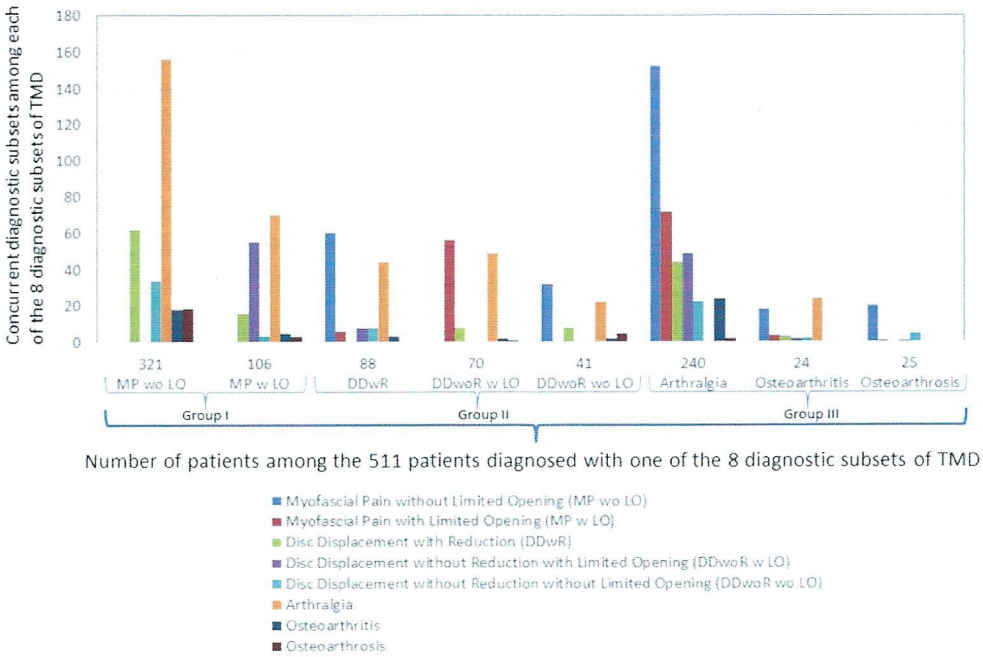

Fig. 1. Concurrent diagnostic subsets of TMD among 511 patients. (*TMD*, temporomandibular disorders.)

bruxism (67%), nonmigraine headache (64%), ear symptoms (60%) (including pain, ringing, fullness, and subjective hearing loss), low back pain (31%), dizziness (22%), and migraine (19%). Overall pain intensity was recorded using a visual analog scale (VAS). On a scale of 0 to 10, the average VAS score for patients in this study was 4.6.

On the medical history form, patients were asked if they were currently experiencing stress at home or at work as a result of their physical condition, or if they were experiencing emotions such as moodiness, depression, nervousness, lack of emotional support, or conflict with family/friends; 47% (242 of 511) responded "yes" to at least 1 or more of the aforementioned stressors or emotions. When asked if they were experiencing difficulties with daily activities, self-care, or housekeeping duties as a result of their physical condition, 22% (110 of 511) responded "yes" to having difficulty with 1 or more of these.

A total of 521 oral appliances were worn by 274 (54%) of the patients, including 146 patients actively using an appliance at the time of their examination. The oral appliances consisted of 11 different structural designs. The 11 appliance designs and the number of patients who wore each appliance were as follows: maxillary full coverage acrylic (237 patients), mandibular full coverage acrylic (83 patients), maxillary full coverage latex (58 patients), anterior bite appliance (32 patients), mandibular full coverage latex (30 patients), pivotal appliance (24 patients), mandibular posterior coverage (21 patients), anterior repositioning appliance (11 patients), thermoplastic (10 patients), over-the-counter (OTC) appliance (9 patients), and hydro appliance (6 patients). In 150 of 274 patients, one appliance per patient was worn. The remaining 124 of 274 patients wore 2 or more appliances each. Nine was the maximum number of appliances (2 patients).

Analysis found that 73% (371 of 511) of the patients took OTC medications, prescription medications, or both to relieve their symptoms. OTC analgesics (ibuprofen, naproxen, acetaminophen, and aspirin) were the only medications taken by 60% of these patients (224 of 371), and 26% (96 of 371) took both an OTC and a prescription medication to alleviate their symptoms. In the other 14% of this subpopulation (51 of 371), prescription medication only was used, including anti-inflammatory agents, muscle relaxers, and narcotics; 29% of the overall group (150 of 511) took 1 or more mood-altering medications. The most frequently prescribed mood-altering medications were antidepressants, taken by 124 of those 150 patients (83%).

All 8 primary diagnostic subsets of TMD had associated concurrent diagnostic subsets (see Figure 1). The largest diagnostic subset of TMD was myofascial pain, and the most common concurrent diagnostic subset that occurred with it was arthralgia. The most common concurrent diagnostic subset identified in group II and group III was also myofascial pain.

DISCUSSION

The RDC/TMD system has been used in a wide range of experimental studies and in population-based studies performed largely in dental university research centers. Patient populations in university studies are acquired by

a variety of avenues, including self-referral, referral by local care providers, response to a study flyer or advertisement, or random selection.

This is the first study that the author is aware of in which axis I of the RDC/TMD was incorporated into an existing upper-quarter examination by a PT for the purpose of identifying TMD diagnostic subsets of patients referred by a variety of dental specialties to an outpatient physical therapy practice. The first aim of this study was to determine whether a PT in an outpatient physical therapy practice could incorporate the RDC/TMD into an upper-quarter examination for the purpose of making a formal diagnosis of TMD and gathering clinical data on the TMD diagnostic subsets of patients referred by dentists. This study found that all 3 groups of the RDC/TMD were represented in 511 patients referred across 18 months, with the largest diagnostic group being muscle disorders (see Table I). Valid diagnoses lend credibility to the practitioner and aids in the education of patients regarding their conditions, treatment options, and expectations of treatment outcomes. Valid diagnoses may also work to mitigate adverse patient psychosocial magnification, the potential progression to chronic pain, and increases in cost to the health care system as a whole.

In this study, a formal TMD diagnosis was not on the written referrals from the majority of dentists. The results of the present study suggest that PTs need to be proficient in the use of axis 1 of the RDC/TMD (including the recent revisions to axis I since the completion of this study).[10,12-21] Although axis I of the RDC/TMD is simple in content and application and is reasonable, reliable, and valid,[20,21] there is no substitution for clinical reasoning to determine if the diagnostic findings are clinically significant to warrant treatment. Using the RDC/TMD alone does not always make an accurate diagnosis, nor does it address making accurate treatment decisions.[22] RDC/TMD and the updated Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) do not require imaging studies to make a diagnosis of TMD.[10,19] Imaging studies such as MRI and computed tomography are required only when clinical signs and symptoms are not responding to conservative care and when imaging studies would contribute to an accurate diagnosis that might change the course of treatment from conservative care to surgery.[19,23]

The second aim of this study was to use the characteristics of this TMD population to inform clinical decision making by PTs and dental professionals in the management of TMD. The majority of patients in this study had concurrent diagnostic subsets of TMD (see Figure 1). Concurrent diagnostic subsets identified in this study are similar to those of other studies, which show that a 1-category diagnostic subset of TMD is scarce in the clinical environment.[22,24,25] The largest subset of TMD is myofascial pain, and the most common concurrent diagnostic subset identified in group II and group III is myofascial pain. The most prudent thing to do therefore in the clinical setting would be to manage myofascial pain. Managing myofascial pain often reduces pain and dysfunction associated with group II and III diagnoses.[26] Treating only myofascial pain may work well for the majority of patients. For other patients, it may be necessary that their concurrent diagnostic subsets be dealt with simultaneously. Unlike other conservative treatments such as medications and oral appliances, physical therapy offers a multimodal treatment approach that is flexible, which would be appropriate when treating 1 diagnostic subset or concurrent diagnostic subsets of TMD. Physical therapy involves patient education, behavioral modifications, several modalities, and therapeutic procedures.[26] Therapeutic procedures include a TMJ, cervical, and upper extremity exercise program and manual therapy such as soft tissue mobilization, joint mobilization, or manipulation and dry needling of myofascial trigger points (MTrPs). A PT can modify treatment parameters within an individual session or from one treatment session to the next on the basis of reassessment of a patient's signs and symptoms. The treatment sequence for concurrent diagnostic subsets becomes a clinical judgment coupled with the clinical presentation of the individual patient. Pending the patient's response to physical therapy, the patient can be reassessed for pharmacologic management, adjustment of an existing oral appliance, or delivery of a new oral appliance.

The therapeutic value of a PT's multimodal treatment approach for 1 or more concurrent diagnostic subsets of TMD should be investigated in randomized clinical trials (RCTs). Unfortunately, the majority of RCTs investigating the benefits of physical therapy examine a single modality or therapeutic procedure.[27] That line of investigation follows a set protocol for 1 diagnostic subset of TMD and refers to this alone as physical therapy.[27] To be clinically relevant and reproducible for optimal outcomes, future RCTs should investigate which combinations of modalities and therapeutic procedures work best for concurrent diagnostic subsets of TMD.

Patients in this study consulted with an average of 3.2 health care professionals. This is not surprising, given that the majority of patients had chronic pain. Patients who see multiple health care providers may be exposed to unnecessary tests for the purpose of diagnosing TMD. Adjunctive procedures involving imaging studies, technologic diagnostic devices, and occlusal studies do not have the sensitivity or specificity required to separate participants with TMD from those without TMD, much less to distinguish among TMD diagnostic subsets.[23,28-30] PTs and dentists should be

prepared to dispel a patient's misguided ideas regarding their symptoms, diagnosis, and treatment that are often acquired from seeing multiple health care providers. Misguided ideas should be replaced with the recent evidence-based recommendations regarding the diagnosis, etiology, prognosis, and treatment options.[23,28-30]

Future studies investigating physical therapy outcomes for patients with TMD need to incorporate axis II of the DC/TMD. That axis was not used to document biopsychosocial issues in the present study. At the time of this study, the appropriate, concise questionnaires used in axis II had not yet been formulated.[19] Fortunately, the clinician's task for the majority of patients experiencing TMD pain is not to render a psychiatric diagnosis; the exception exists when such a diagnosis is needed to initiate a referral to the appropriate health care professional for in-depth counseling, pharmaceutical assistance, or both.[1]

When designing an examination and intervention plan, dental professionals and PTs need to recognize if a patient has cervical spine involvement. Cervical spine tissues can be a source of head, jaw, and facial pain and can precipitate or perpetuate the patient's masticatory muscle pain. Neck pain was the second most common symptom in the present study, reported by 68% of the 511 patients. The coexistence of neck pain and TMD has been reported previously and its clinical implications should not be underestimated.[31-33] Neck pain originates from pain-sensitive tissues of the cervical spine, including muscles, facet joints, nerves, and disks.[34] Involvement of these pain-sensitive tissues is referred to as a cervical spine disorder (CSD).[1] Pain-sensitive cervical spine tissues innervated by C1, C2, and C3 converge onto the trigeminal spinal nucleus, referred to as the trigeminocervical nucleus.[35] Substantial evidence has confirmed that pain-sensitive cervical spine tissues refer pain to the head, jaw, and face via the trigeminocervical nucleus,[1,35-37] and such referred pain is called a cervicogenic headache.[38] The International Headache Society has published detailed diagnostic criteria for diagnosing cervicogenic headache.[38] Cervical spine muscles are the predominant pain-sensitive tissues that studies have found to be a source of cephalic symptoms.[26] Cervical spine muscle pain caused by latent or active MTrPs has been found to be a source of nonmigraine headache (cervicogenic headache)[39,40] and to play a role in the pathogenesis of migraine headache[41-43]; MTrPs also can cause ear symptoms such as tinnitus and dizziness.[44-46] Allergies, sinusitis, otalgia, ophthalmalgia, odontalgia, and other disorders of the head can concurrently exist with neck pain, adding to the complexity in the management of the patient's symptoms. Referral to the appropriate health care professional may be necessary to manage these associated disorders.

MTrPs located in the sternocleidomastoid and trapezius have been found to be primary trigger points that perpetuate satellite MTrPs located in the temporalis and masseter muscles.[47] MTrPs located in the temporalis and masseter muscles may be resistant to treatment (oral appliance therapy or medications) until MTrPs in the cervical spine muscles are addressed.[26] Studies also have found a synergistic relationship between cervical spine muscles and the muscles of mastication.[48-50] The majority of patients in this study were diagnosed by this CE with masticatory muscle pain, with or without limited opening. Clinical implications suggest the need to manage MTrPs located in the neck and shoulder girdle muscles to reduce masticatory muscle activity. This could also reduce nonmigraine headaches, migraine headaches, ear symptoms, and dizziness if other causes are not clearly identified.[26]

Dentists can suspect that a patient has a CSD contributing to the TMJ muscle pain, tension, facial pain, and headache if any of the following are true:

1. The patient complains of neck pain, tension, or tightness.
2. The patient scores high on the Neck Disability Questionnaire.[51]
3. The patient's familiar symptoms, including headache and facial or ear pain, are not reproduced during the RDC/TMD examination.[52]
4. The patient has not responded to oral appliance therapy.

Dentists can perform a screening examination of the cervical spine intended to reproduce the patient's familiar local or referred symptoms by the following methods[26]:

1.Palpating the trapezius and sternocleidomastoid muscles.
2. Palpating over the greater occipital nerve.
3. Having the patient actively flex, extend, rotate, and side bend their cervical spine.

The 2013 Orofacial Pain Guidelines for Assessment, Diagnosis, and Management recommends that MTrPs in the neck and shoulder girdle muscles deserve significant attention in the diagnosis and treatment of patients with head, jaw, and facial pains.[1] To date, PTs with a multimodal treatment approach are best equipped to manage patients with CSDs.[26]

Oral appliance therapy is a primary conservative treatment modality offered by dentists in the treatment of pain originating from the muscles of mastication and TMJ.[53] Over half of the patients in this study had worn or were wearing an oral appliance at the time of referral, with 11 different structural appliance designs being represented. Dr Fricton's comments on oral appliance

therapy are: "Some clinicians view orthopedic appliances as the definitive therapy for TMD, but it is recommended that these appliances only be viewed as only part of a TMD rehabilitation treatment program to encourage healing and normal function."[30] Therapeutic benefits from wearing an oral appliance by the majority of patients in this study may have been diminished for any of several reasons. First, the majority of patients had concurrent diagnostic subsets of TMD, making it less clear what the appropriate oral appliance design should have been. Second, satellite (or secondary) trigger points located in the masticatory muscles may prove resistant to treatment until the primary trigger points located in cervical spine musculature have been treated first, thus rendering an oral appliance ineffective at treating the primary cause of patient symptoms.[26,47] Third, it is not clear that the patient's oral appliance design was always evidence-based or that the appliance was indicated.[54] Current guidelines[54] suggest that appropriate indications for wearing an oral appliance are as follows:

a. Waking up at night or in the morning with head, face, and jaw pain due to masticatory muscle pain or arthralgia as a result of bruxism
b. Waking up in the morning with locking of the jaw as a result of bruxism
c. Severe attrition of the teeth as a result of bruxism

Unless there are clear indications for oral appliance therapy, dentists may want to postpone fabrication and delivery of an oral appliance pending the patient's response to physical therapy.

CONCLUSION

This study describes the patient population likely to be seen by PTs in a similar practice setting when patients are referred from dental professionals, and it identifies what diagnostic subsets PTs must be capable of treating. The characteristics of patients diagnosed with TMD described in this study suggest that conservative care consisting only of the use of an oral appliance, pharmaceutical support, or behavioral modification may fall short in managing the pain and functional limitations associated with TMD. Dentists should involve the services of PTs early in the plan of care and should refer patients to PTs who are trained in the evaluation and management of TMD and CSD. Various organizations can assist health care professionals and patients to locate local PTs[55] and dentists[56] who are certified in the treatment of TMD, neck, and orofacial pain. However, there are many qualified PTs and dentists who, although not certified, can still provide the necessary evidence-based treatments. The most important aspect of managing TMD may be a team approach among health care professionals.

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