

Guest Editorial

Rehabilitation for temporomandibular disorders

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Dear colleagues,

Temporomandibular disorders (TMD) are a heterogeneous group of pathological conditions that involve the temporomandibular joint (TMJ), the masticatory muscles, and the associated anatomical structures [1]. TMD are the second most common musculoskeletal chronic pain disorders after the low back pain, with an estimated prevalence ranging from 10.6% to 68.1% in males and from 21.2% to 72.4% in females [2]. TMD clinical manifestations include joint noises, jaw movement dysfunction, and pain, that can start from TMJ diffusing to ears, temple, shoulders, and cervical region [3,4]. Patients may experience some non-specific symptoms such as tinnitus and dizziness, headaches, and neck and shoulder pain [3,4]. Furthermore, TMD are responsible of limitations in basic activities of daily living, as chewing, talking, swallowing, yawning, and negatively influence the oral health related quality of life [5].

To better define these disorders, the International Research DC/TMD Consortium Network and the Orofacial Pain Special Interest Group developed the Di-

agnostic Criteria for Temporomandibular Disorders (DC/TMD) Axis I to classify the TMD into: myofascial pain, disc displacement, and TMJ arthralgia, arthritis, and arthrosis [1,6]. Moreover, the DC/TMD Axis II allows assessing the pain related disability by evaluating the psychological status and the psychosocial functioning, considering that the risk of anxiety and depression was shown to be increased whether during the acute or the chronic TMD phase [1,7].

In this context, a wide range of literature has been provided on TMD in the last years, as reported by a recent bibliometric analysis published in the *Journal of Back and Musculoskeletal Rehabilitation* (JBMR) that showed an increasing number of citations for articles on TMD [4]. More in detail, the paper with the highest number of citations ($n = 3020$) was on TMD research diagnostic criteria [6], testifying the importance of the classification of TMD to have an adequate diagnosis. Moreover, it should be noted that the diagnosis is clinical and can be supported by magnetic resonance imaging exams for inflammatory conditions and soft tissue areas, including muscles, ligaments, and TMJ disc, and by cone beam computer tomography for skeletal and dental tissues [8,9].

As reported by recent systematic reviews with meta-analyses [10,11,12], rehabilitation might play a key role in the management of TMD; physical therapy, laser therapy, extracorporeal shockwave therapy (ESWT), transcutaneous electrical nerve stimulation (TENS),

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temporomandibular joint injections, and occlusal splints are considered as the first-line treatments. These rehabilitative approaches were shown to be effective in improving articular range of motion, reducing pain, and preventing further degenerative damage [10,11,12]. A double-blind randomized controlled trial (RCT) by Dıraçoğlu et al. [7] assessed the efficacy of dry needling in patients affected by myofascial pain. The authors showed a significant decrease in pain VAS in the study group after treatment (p -value < 0.001) and significant higher mean algometric values in the study group. Furthermore, a recent systematic review and network meta-analysis by Yao et al. [13] including 153 RCTs assessed the efficacy of the available therapies for TMD chronic pain concluding that rehabilitation is effective for pain relief in these subjects. More in detail, cognitive behavioral therapy (CBT), therapist-assisted jaw mobilization, supervised jaw exercise and stretching, and manual trigger point therapy were reported as the most effective therapies for pain relief in patients with TMD.

Concerning the role of physical agent modalities in these subjects, two systematic reviews [10,11] reported that low-level laser therapy (LLLT) was among the most investigated TMD treatments, and the wavelength of 910–1100 nm was shown to be the most effective in reducing pain [10,11]. However, there is still a lack of consensus on the effective duration and frequency of LLLT sessions in the treatment of TMD [11]. Moreover, Marotta et al. [14] assessed the safety and efficacy of physical exercise combined with radial ESWT in patients with myofascial pain related TMD, and showed a statistically significant pain reduction (p -value = 0.021) in the study group compared to placebo after treatment.

A strong association between TMD and pain in the cervical region has been reported, probably due to neurological and biomechanical communications that result in a close interaction between the mandibular and cervical systems [15,16,17].

Furthermore, it is well recognized that physical therapy (including manual therapy and kinesiotaping) might be effective in reducing pain in patients with concomitant TMD and neck pain, considering that TMD patients often report neck pain at the cervical muscles, especially sternocleidomastoid and upper trapezius [18,19,20]. Indeed, Serrano-Hernanz et al. conducted a RCT to determine whether pressure release technique (PRT) was effective for reducing pain in subjects with chronic myofascial TMD [19]. Their results showed a significant reduction in VAS pain in the PRT group (p -value < 0.001).

This issue of JBMR deals with these aspects, and it is with great pleasure that we award the Editor's Choice article to Miçooğulları et al. [20], who highlighted that postural stability, TMJ, and cervical joint position sense appear to be affected in individuals with cranio-cervico-mandibular malalignment who need specific rehabilitative treatment. Their paper has been made freely available for you to read, download, and share.

In conclusion, we could affirm that the rehabilitative conservative therapies can be considered effective in reducing pain in TMD and we welcome further high-quality studies in JBMR to obtain a scientific consensus regarding the best rehabilitative approach for pain relief in these patients.

On behalf of the editorial team of JBMR, we hope you enjoy reading this issue!

Conflict of interest

The authors have no conflicts of interest, funding sources or consultant relationships with any organizations involved in this research to declare.

Author contributions

Study conceptualization: AdS; Methodology: AdS; Investigation: MF; Writing-Original Draft Preparation: MF; Writing-Review and Editing: AdS; Study supervision: AdS. Both authors have read and agreed to the published version of the manuscript.

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