Chew on This: The Afterbite of Temporomandibular Joint Involvement in Adults With Juvenile Idiopathic Arthritis

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Juvenile idiopathic arthritis (JIA) is a chronic autoimmune disease that continues into adulthood in approximately 50% of patients.1 Growth considerations are unique to pediatric-onset disease and can lead to permanent joint damage. JIA affecting the temporomandibular joint (TMJ) during childhood is particularly subject to irreversible damage if left undetected and untreated. The mandible takes approximately 18 years to complete its growth, longer than most other joints. Thus, assessment of the TMJ needs to consider growth and damage and should be evaluated into adulthood.

TMJ arthritis has a reported incidence of 17% to 92% in the literature but more likely occurs 30% to 40% of the time.2,3 TMJ arthritis can occur in isolation or as part of any subtype of JIA.4,5 Clinical manifestations can include decreased mouth opening, pain with chewing, pain with yawning, asymmetrical mouth opening with deviation, TMJ muscular pain, obstructive sleep apnea, and dentofacial abnormalities such as microretrognathia.6 In the end stages, when the TMJ arthritis is quiescent and in remission, TMJ dysfunction may require jaw reconstruction or replacement, and patients often pursue cosmetic reconstruction.2

The TMJ is an elusive joint that is often clinically asymptomatic despite active disease, thus making early detection a challenge.7,8 Prebiologic studies have looked at the progression of TMJ arthritis with magnetic resonance imaging (MRI) studies, and found that over a 27-year period, bilateral TMJ arthritis progressed from 60% to 80% in patients with JIA, and over 50% had worsening of their existing TMJ arthritis.9 With use of biologics, this number is lower because there is better overall control of systemic disease, but possibly more severe disease on the outset, requiring biologic therapy.10 In contrast, Ringold et al surveyed adult rheumatologists internationally, who stated only 25% of their patients had TMJ arthritis,11 a stark contrast from the larger numbers quoted in the literature, suggesting underrecognition of this problematic joint in adults with JIA.

In this issue of The Journal of Rheumatology, de Sonnaville et al, in a cross-sectional study of 100 adults with JIA and 59 healthy controls, studied clinical variables that indicated TMJ involvement in adult patients with JIA.12 Although MRI with contrast is the undisputed gold standard for diagnosis and monitoring of TMJ arthritis,3,13 it can be costly and difficult to access as a standard of care. De Sonnaville et al used clinical features and measurement tools comparing adults with JIA with TMJ disease (56% of the cohort) to adults with JIA and no TMJ disease, and to healthy controls, to see if these measurements could aid in determining TMJ involvement in adults with JIA. Clinical features, such as crepitation (50%), deviation during mouth opening (48%), asymmetry (39%), and retrognathia (39%), were most often associated with TMJ disease in patients with adult JIA.12

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The importance of screening TMJ in patients with JIA is emphasized in the study by de Sonnaville et al as they offer alternatives to MRI that can be completed in a routine clinical visit. De Sonnaville et al used active maximum incisor opening (AMIO) and anterior maximum voluntary bite force (AVBF) as objective measures to routinely screen for TMJ involvement, in addition to history and clinical examination. They found that AMIO was 8.8 mm (95% CI –11.40 to –6.12; P < 0.001) lower in adults with JIA and concurrent TMJ disease compared to adults with JIA without TMJ disease, suggesting that AMIO is a helpful measuring tool to detect TMJ involvement in this population. AVBF was not found to be statistically significant to distinguish TMJ involvement in adults with JIA. Therefore, the AMIO as a measurement tool may help tailor further assessment pathways, such as referrals to multidisciplinary dental teams, and aid in determining the need for MRI, especially in areas where these resources are limited.

Limitations of this study mentioned by the authors include selection bias, as patients were seen in an academic hospital, perhaps indicating more severe disease. There was no blinding for practitioners doing the assessment to which patients had a history of JIA and/or TMJ involvement, which raises potential bias when performing the measurements. Most studies for TMJ assessments are cross-sectional; a randomized controlled trial may help us determine the best screening methods for TMJ. Further, the study took measurements of the TMJ at only 1 timepoint, whereas it is more useful to perform serial measurements over time to track TMJ disease activity and progression.

Since most TMJ arthritis is asymptomatic, clinical findings often appear when the jaw is already damaged, when it may be too late for systemic therapy to have an effect. Recent guidelines note the importance of TMJ assessment but do not offer specific physical examination techniques and/or measurement instruments to use. A review article on TMJ noted that both decreased AMIO and jaw deviation had a positive predictive value of 100% for TMJ arthritis, which is in line with findings in the study by de Sonnaville et al. A study by Whittingslow et al used acoustic emissions to measure if amplitude changes within the jaw correlated with disease. Determining and validating standard nonimaging examination tools with serial assessments will be invaluable in monitoring TMJ disease as an adjunct to imaging.

Other TMJ conditions also exist and should be considered in the differential diagnosis of isolated TMJ arthritis. Idiopathic condylar resorption is a rare degenerative joint disease leading to intraarticular abnormalities that is usually diagnosed with MRI imaging and can present with anterior open bites and TMJ clicking during function. Anterior disc displacement is the most common intraarticular TMJ disorder, where the TMJ is subluxed anteriorly upon opening. Anterior disc displacement may cause progressive TMJ degeneration and can mimic JIA and idiopathic condylar resorption. Some clues to differentiate between these entities include non-JIA patients with anteriorly displaced discs, normal disc size, and less inflammation compared to patients with JIA. It is important to ensure that MRIs follow appropriate protocols with contrast and are read by musculoskeletal radiologists to help differentiate between diseases. Noninflammatory TMJ disorders are especially important to consider in the adult setting where they are more likely to be the cause of pain rather than those resulting from an active inflammatory arthritis such as TMJ dysfunction, inflammatory osteoarthritis from damage, fibromyalgia, teeth grinding, and muscle tension.

Future research should include screening a wider population of patients with JIA, using MRI with contrast, and correlating this to clinical findings to inform standardized screening tools. There is also increasing interest in the role that ultrasound could play in the evaluation of the TMJ, but ultrasonography does not successfully capture intraoral images to assess the medial condyle and is highly operator-dependent. Finally, with the innovation of personalized medicine, genetic studies into the types of predictors for TMJ disease and/or refractory disease may offer further insight into how to prevent and treat TMJ disease in the future.

Consensus guidelines have been developed; however, there continues to be debate among practitioners around how aggressively to treat TMJ arthritis in patients with JIA of any age since the majority are asymptomatic. The literature shows that biologics help decrease joint replacement, and early initiation of biologic therapy has altered poor TMJ outcomes. De Sonnaville et al showed prebiologic era patients had collinearity with disease duration (28.5 vs 10.7 years in the biologic era; P < 0.001) and subtype of disease, making correlation of biologic use to TMJ outcomes challenging in this study. When they were surveyed, adult rheumatologists treating TMJ disease in adult patients with JIA tended to treat with physiotherapy and splinting, which may not be as effective as systemic therapies with both conventional and biological disease-modifying antirheumatic drugs. Therefore, working closely with patients, caregivers, and multidisciplinary teams is exceedingly important in making such treatment decisions.

The high prevalence of clinically established TMJ involvement in adults with JIA indicates the need for awareness of TMJ problems in both children and adults with JIA. If clinical detection of TMJ involvement occurs mainly once the damage is done, then we need to consider specific screening protocols in both adult and pediatric patients with JIA to detect and treat active TMJ arthritis early. MRI, which remains the gold standard in diagnosis and monitoring, can be costly and difficult to obtain in a timely fashion. Therefore, standardized history-taking questions and physical examination techniques, such as those provided in the study by de Sonnaville et al, offer a practical and feasible starting point. Both pediatric and adult rheumatologists need to be trained in the assessment and techniques for measurement of TMJ involvement, and serial measurements can be helpful to monitor progression. Ongoing collaboration with multidisciplinary teams involving pediatric and adult rheumatologists, dentistry, surgery, and physiotherapy in assessment, monitoring, treatment, and research of TMJ arthritis will be critical to ensure the best possible outcomes for our patients with JIA with TMJ involvement as they grow up.
REFERENCES