

Management of Temporomandibular Joint Arthritis in JIA: Tradition-based or Evidence-based?



Only a decade ago, the temporomandibular joint (TMJ) was referred to as “the forgotten joint in juvenile idiopathic arthritis (JIA)” owing to a lack of clinical and research attention¹. More recently, with the finding that TMJ arthritis is seen in a majority of patients with JIA², an increasing amount of research has focused on this joint. TMJ arthritis may cause pain, impair joint and masticatory function, and affect dentofacial growth, leading to facial asymmetry and bite disturbances. TMJ destruction from arthritis significantly harms oral health and general quality of life³.

Despite progress in research, strategies for management of TMJ arthritis are still based primarily on conviction and tradition rather than science. Systemic therapy is frequently ineffective in controlling TMJ disease⁴. By tradition, local management with intraarticular corticosteroid injection (IACI) is a common backup plan^{5,6}. This has evolved from the decades-long effective use of IACI in management of adult temporomandibular disorder⁷. In early translation of this technique to children with JIA, it was found to be safe and effective⁸. IACI improves TMJ/mandibular function and provides pain relief for patients with JIA⁹. Further study, however, has found that the clinical benefits of IACI usually dissipate within the first year¹⁰. Further, while local inflammation decreases after IACI, it is rarely reduced to normal¹¹.

Translating evidence from literature into clinical care is challenging when that evidence conflicts with tradition. For example, while intuition leads to the conclusion that the antiinflammatory effect of TMJ IACI is protective against the sequelae of chronic TMJ arthritis, no study to date has supported this assumption^{9,10}. On the contrary, concerns about TMJ IACI were raised in 2008 after IACI was found to impair rather than improve mandibular growth in an animal model¹². To understand this effect, one must appreciate the unique properties of the TMJ in dentofacial growth

and development. The primary growth site of the mandible is located within the joint and protected only by a thin layer of fibrocartilage. Therefore, the mandibular growth plate is exposed to a high dose of corticosteroid during IACI. Corticosteroids are known to impede growth and bone development¹³. It follows that TMJ IACI could inhibit mandibular growth, independent of its effect on arthritis. In 2015, Lochbühler, *et al* found exactly that in a retrospective review of 33 children with JIA who had TMJ IACI: TMJ intraarticular corticosteroid exposure was negatively correlated with mandibular growth¹⁴. In addition, in their small sample, Lochbühler, *et al* found intraarticular heterotopic bone formation (HBF) after IACI in 21% of injected TMJ, and the incidence was positively correlated with the cumulative corticosteroid dose.

In the present issue of *The Journal*, Stoll, *et al*¹⁵ found that 14% developed HBF after TMJ IACI in a retrospective study of 238 children. In this study, nonresponders to TMJ IACI received intraarticular TMJ injections with infliximab. In a univariate analysis, Stoll, *et al* demonstrated that the number of injections was a risk factor for HBF and that those with HBF had worse mouth opening and more mandibular deviation than those without. Three patients with HBF required total joint replacement. Those patients with a long lag between JIA diagnosis and IACI had a lower rate of HBF than those who had early IACI. The authors conclude that the injections were likely causative of these calcifications. However, Stoll, *et al* also correctly conclude that future studies are required to determine whether the risk of developing HBF is caused by the injection or the underlying disease. With these findings, Stoll, *et al* contribute important knowledge regarding the side effects of TMJ IACI in growing individuals. Similar findings have led many experts to reconsider the use of IACI in children with JIA^{10,16}.

Science is a cumulative process through which new

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findings are placed in the context of existing literature to improve care. Evidence-based medicine requires that treatment benefit is weighed against potential harm. As stated by Stoll, *et al*, the side effects of TMJ IACI are not yet fully understood. Thus, the role of IACI in the management of TMJ involvement from JIA has not been finalized. The benefits in pain reduction and improved function, at least in the short term, cannot be ignored. Neither can the emerging evidence of potential harm. Further studies are needed to help physicians place these risks and benefits into clinical context. However, the findings by Stoll, *et al* support our assertion that IACI should not be part of the standard treatment algorithm for skeletally immature patients with TMJ JIA. IACI may continue to play a role in refractory cases and in skeletally mature patients¹⁷.

Innovation requires experimentation, and in medicine, our patients must sometimes serve as our subjects. However, this brings a great responsibility to critically assess outcomes with unbiased, scientific rigor. Stoll, *et al* should be complimented for doing this, as they present a negative outcome for a procedure that they perform frequently to inform the scientific community. The recent findings by Stoll, *et al* leave us with 2 questions: (1) Are we ready to discontinue the tradition of treating JIA-associated TMJ arthritis with IACI? And (2) what is the best treatment for JIA-associated TMJ arthritis? If future arthritis management is to be improved, we will need to consider TMJ arthritis in a broader context. TMJ arthritis and its consequences must be considered in comprehensive JIA management strategies, and knowledge gained must be disseminated in literature and be reflected in our clinical care. Recently published protocols for orofacial¹⁸ and MRI¹⁹ evaluation of patients with JIA will help standardize this discussion. Optimal interdisciplinary TMJ arthritis management involves diagnostic assistance from the radiologist, antiinflammatory immunomodulatory strategies of the pediatric rheumatologist, growth-supporting orthopedic treatment strategies of the orthodontist, restoration of anatomy by oral and maxillofacial surgeons, and other treatment by appropriate specialists.

Stoll, *et al* should be complimented for their important contribution to this issue of *The Journal*. The increasing attention to TMJ arthritis and its treatment will ultimately benefit our patients. Currently, the treatment of JIA-associated TMJ arthritis remains a burden for the patient and healthcare provider, and more multidisciplinary research is necessary to replace tradition with evidence-based management.

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