

## CRITICAL COMMENTARY 1

THE ETIOLOGY OF TEMPOROMANDIBULAR DISORDERS:  
IMPLICATIONS FOR TREATMENT

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**D**r Greene has provided in his Focus Article a well-written review of the etiology of temporomandibular disorders (TMD).<sup>1</sup> However, it may seem provocative to many people. Its conclusion that all old etiologic concepts are incorrect is probably discouraging to many of those who have been working in the TMD field for several decades. The unicausal etiologic concept—that TMD is one disorder with one cause—has long since been abandoned. It has been widely accepted that TMD are a set of disorders affecting the stomatognathic system; this has led to new explanatory etiologic models, eg, the multifactorial and biopsychosocial concepts. The goal for much of the more recent research has been to clarify the etiology of the various types of disorders that most people currently agree constitute TMD.<sup>2,3</sup> Greene not only rejects the unicausal concept, but he also considers the multifactorial and biopsychosocial concepts seriously flawed, even if he submits that they may be correct at the group level. His conclusion is that at the individual TMD patient level, there is nearly always an idiopathic situation, ie, we do not know why the individual patient has a TMD. However, he gives some comfort by saying that even in the absence of a perfect understanding of etiology, we still can provide good conservative care that may be helpful for the majority of TMD patients. The argumentation for his statements is strong and convincing, but it deserves some critical comments.

### Are Temporomandibular Disorders Idiopathic?

Greene can find support in a recent proposal for a new classification system of idiopathic orofacial

pain.<sup>4</sup> This Focus Article, by Woda and Pionchon, included as idiopathic not only so-called atypical types of pain but also facial arthromyalgia, a term that seems to correspond to TMD. The inclusion of all types of TMD in this group probably surprised many readers, and it was also questioned, especially in one of the commentaries to the article.<sup>5</sup> In a similar way, Greene's suggestion that TMD etiology is unknown at the individual patient level may be too pessimistic. Acute muscle and TMJ pain can often be identified as caused by trauma to the face or an inflammatory process in the TMJ. Many TMD have been studied extensively and well described, and this knowledge should of course be used not only at the group level but also in managing an individual patient who fits a known diagnosis with reasonable certainty. However, we have to agree that in many patients with chronic orofacial pain, the etiology is unknown. For such conditions, the "idiopathic" label may be adequate. The implications for treatment of patients with such conditions are well described in Greene's article. Escalation of the therapeutic attempts can lead to overtreatment and should be avoided.

### Occlusion and Temporomandibular Disorders

Greene has written very little about occlusion and TMD in his article, which is surprising given the enormous earlier interest in this topic. Greene refers to some of his previous papers in which he has repudiated occlusal and other mechanical and structural factors in TMD etiology. Nevertheless, a brief but clear discussion of the importance of occlusion would have been desirable. A majority

of dentists in the United States and probably in several other countries still believe that occlusal factors are of great importance for development of TMD, and consequently they also consider occlusal treatment to be essential in the management of TMD patients.<sup>6,7</sup> Dentists with such a belief will most probably regard a review of TMD without discussion of the role of occlusion as inadequate. Even if most “TMD experts” agree today that the role of occlusion is minor in TMD etiology,<sup>8-10</sup> there are groups of colleagues who still maintain that occlusion has a great influence on TMD.<sup>11</sup> Such statements are certainly based more often on emotions than on evidence. However, there are researchers who have had serious ambitions to further evaluate this issue through the use of well-designed, long-term, controlled clinical studies. Based on results of a 4-year comparison of real and mock occlusal adjustment, Kirveskari et al concluded that elimination of the presumed structural risk from the dental occlusion appeared to significantly reduce the incidence of TMD in a select group of young subjects.<sup>12</sup> As a consequence, they also suggested the need for further clinical studies.

The continuing divergence of opinions indicates that this issue deserves further discussion, based on the best possible evidence. It is difficult to convince colleagues who believe in a great influence of occlusion on TMD development that it is nonexistent or very small. The discussion must be better structured than it usually has been between “occlusionists” and “nonocclusionists.” To start by agreeing that occlusion is of great importance in restorative dentistry and prosthodontics may be helpful. The next step—discussion of the relationship between TMD and occlusion—may then be easier. The most extreme standpoints should also be avoided. A recent review concluded that occlusion does not play a major role in the etiology of TMD; however, the impact of occlusion is not zero, and should be determined in each individual patient.<sup>9,10</sup> To ease the reluctance to abandon non-supported dogmas on occlusion, it may be appropriate to acknowledge that initial simple occlusal adjustment may be as effective as any of the non-dental low-tech therapeutic approaches available.<sup>13</sup> At that point, it might be easier to gain acceptance of the fact that there is no evidence to support repeated or extensive occlusal therapy as a meaningful TMD treatment.

## Evidence-based Dentistry

With the increased emphasis on evidence-based care, the efficient transfer of knowledge from scientific results to the clinical practice is essential. Researchers and educators have obviously, to a large extent, failed to transfer the evidence-based knowledge available in the TMD field to general practitioners. It takes time to change opinions. To shift the occlusion paradigm that was so predominant for so long in the TMD field will require generations of dentists. So many dentists have been “indoctrinated” with what at the time of their dental training was considered the “definitive truth” on occlusion and TMD, and some of them will keep their conviction forever. The opposition against abandonment of occlusal etiology has been strong, as seen in many conferences focusing on occlusion and TMD. The turbulence at one of these events has been described as “a clash of cultures—between that of the researcher and that of the practitioner.”<sup>14</sup> The discussion continues on a quite aggressive level, the anger of the clinicians is obvious, and much of the research on which the “TMD experts” base their conclusions is called into question.<sup>15</sup> If the evidence provided so far is not convincing enough, more high-quality clinical research should be performed. To solve this discrepancy in opinions in a longer perspective, it is necessary that dental education at all levels be permeated by a strong emphasis on evidence-based principles. Students must also be taught the need for continuing education and perusal of the relevant literature.

The discrepancy between evidence-based knowledge and clinical practice is not unique to the TMD field. The example cited by Greene—a paper from 1984 regarding back pain—is still relevant in the year 2000 according to Cochrane Reviews available as abstracts on the Internet (<http://www.update-software.com/ccweb/cochrane/revabstr/g05index.htm>). Similar situations are evident in other areas of dentistry. The etiology of dental caries and periodontal diseases is well understood, and efficient methods of preventing and controlling these diseases have been developed.<sup>16</sup> Nevertheless, these diseases are far from eradicated, because the knowledge has not been generally implemented.<sup>17</sup> Caries prevalence has, however, decreased in most industrialized countries during the last 2 decades, and the prognosis for further improvement through the use of the available knowledge is good.<sup>18</sup>

In the TMD field there is, as Greene notes, an enormous amount of specific knowledge, thanks to

the extensive research of the past 40 years. We have learned to manage successfully most TMD patients by using a "low-tech, high prudence therapeutic approach."<sup>19</sup> In Scandinavia, a similar approach has been applied for decades, emphasizing simple methods in diagnosis and management of TMD.<sup>20</sup>

## Future Perspectives

Greene believes more in basic than in clinical research for future development of more precisely targeted therapies. The basic methods will of course be of great importance, as they have already been for pain and related research. A problem has been the difficulty of having the new knowledge disseminated and understood at the clinical level. Therefore, I think that well-planned and performed clinical studies continue to be necessary to test, apply, and control results of laboratory research. The ultimate goal is of course to reduce as much as possible the impression that the etiology of TMD is idiopathic.

## Conclusions

Greene has provided a thought-provoking article that deserves to be read and discussed by all interested in TMD. I think that the idiopathic label should be used as little as possible, but it has to be admitted that the etiology and pathophysiology are poorly understood in many TMD patients, especially in those with chronic problems. There is a need for more good clinical studies in the TMD field. The prolonged controversy surrounding the relationship between TMD and occlusion can only be settled by acceptance of evidence based on high-quality research.

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