

Evaluation of the Research Diagnostic Criteria for Temporomandibular Disorders for the Recognition of an Anterior Disc Displacement with Reduction

Jeffrey P. Okeson, DMD

Professor and Chair, Department of Oral Health Science

Director, Orofacial Pain Program
University of Kentucky College of Dentistry
Lexington, KY 40536-0297
Email: okeson@uky.edu

It became evident in the late 1980s that the scientific evidence in the area of temporomandibular disorders (TMD) was not very reliable. Much of this stemmed from poor study design, lack of proper controls, and inadequate followup. A significant contributor to the poor study design was a lack of specific and consistent criteria to identify the study population. The development of the Research Diagnostic Criteria (RDC) was an attempt to assist researchers in defining and categorizing the subject populations that were being studied.¹ The RDC were embraced by the research community because for the first time, researchers had a standard method by which to identify specific populations to be studied. Although helpful for strengthening research design, most clinicians quickly realized that the broad RDC categories of TMD offered very little assistance in managing these patients.

A confounding issue that affects the RDC is the fact that there are two general belief models regarding TMD. By definition, temporomandibular disorders represent a group of musculoskeletal disorders of the masticatory structures.² One group believes that most TMD symptoms can be lumped into a few broad categories of symptoms that are predominately a reflection of a variety of systemic medical conditions.^{3,4} For this group the RDC seem to satisfy their needs. The second group feels that TMD is made up of a group of musculoskeletal pain conditions, all of which are somewhat different and therefore require different treatment strategies.^{2,5} For this group, the broad categories described by the RDC contribute little to the selection of proper treatment that will assist the patient. Complicating this is the fact that there are systemic conditions that present with TMD-like symptoms in the orofacial structures. When

this occurs, the clinician needs to recognize these medical conditions and direct treatment toward them instead of the masticatory structures. Therefore, separating systemic medical conditions from local conditions should become an important part of any diagnostic criteria. In a similar sense, separating chronic conditions from acute conditions is also useful since chronic conditions often require different treatment strategies than the acute conditions. Certainly both researchers and clinicians need specific diagnostic categories to assist in accomplishing their tasks.

In their Focus Article, Naeije et al⁶ demonstrate how difficult it is to develop specific criteria that can accurately separate the various types of TMD. The authors mention two of the more common intracapsular disorders, anterior disc displacement with reduction (AADR) and symptomatic hypermobility. The authors note that these two conditions need to be managed differently and therefore it is important to differentiate them so that proper treatment may be selected. It should also be noted that these two disorders possess clinical characteristics that offer more objective measurability than most TMD. One would expect therefore that differentiating these disorders would be less difficult than other disorders that require more subjective assessment, such as different muscle pain conditions.

The authors take each specific RDC criterion for AADR and evaluate its appropriateness by using an electronic mandibular movement recording device. The authors have verified the validity and reliability of this instrument and have demonstrated that it can be used to objectively record and measure mandibular movements.⁷ Therefore, it would seem to offer an objective method of evaluating the reliability of the RDC. They have also verified that the results for assessing the disc position with this

device are in agreement with magnetic resonance imaging (MRI) findings, which is considered the gold standard. In the present study no MRI was used with these subjects to verify the disc position. Instead, the results of the tracings were compared to “hundreds of patients and controls with or without anterior disc displacement with reduction” who were evaluated over many years in their clinic. It is a commonly accepted practice that once an instrument has been determined to provide accurate and reliable results compared to the gold standard it can then be used independently. However, it is also true that joint sounds may be the result of disorders other than disc displacement with reduction. The authors discuss symptomatic hypermobility as a source of joint sounds but other conditions such as alterations in form, adhesions/adherences, disc perforations, or even chronic disc dislocations without reduction may also produce sounds. Assuming that all clicks are related to either a disc displacement or a symptomatic hypermobility is a very limited concept. The authors undoubtedly appreciate this view; however, there is little mention of these possibilities in the article.

Although the authors mention the importance of differentiating AADR from symptomatic hypermobility, they elected to only evaluate the ability of the RDC to differentiate ADDR. An interesting study would have been to use the electronic mandibular movement recording device to evaluate the effectiveness of the RDC in differentiating a group of MRI-verified ADDR patients from a group of MRI-verified symptomatic hypermobility patients. All we can learn from this study is the ability of the RDC to accurately identify a patient with an ADDR. Still, even when considering only ADDR, the authors make a compelling argument for the unreliability of the RDC.

In a very detailed manner the authors evaluated and elaborated on each of the five criteria included in the RDC for disc displacement with reduction. Their assessments will be discussed here for each of the criteria.

Reciprocal Clicking During Opening and Closing

The authors suggest that reciprocal clicking may not be a dependable characteristic for all ADDR. They base their thoughts on the likelihood that interarticular pressure is different between the opening and closing phase of jaw movement. It is logical to assume that as the mouth closes there is less interarticular pressure than during opening and

therefore a disc can return to a displaced position with less or no joint sound. It would appear reasonable to believe that applying extraoral forces to the mandible in a manner that would increase interarticular pressure would change the presence and/or position of the sound joint. The authors suggest that applying a small amount of force to the patient's chin will increase the joint sound. This is an interesting concept that needs to be more thoroughly studied to determine validity and reliability.

Clicking Sounds Reproducible on at Least Two of Three Consecutive Movement Trials

When evaluating this criterion the authors chose to discuss the acoustic intensity of the sound and not the reproducibility of the sound. Certainly if the sound is not intense enough to be recorded then this becomes a significant factor in determining reproducibility in two of three trials. The authors make a valid case that this could be a factor that needs to be considered when determining the reliability of this test to diagnose disc displacement with reduction. However, an additional factor is the variability of joint sounds over time in any individual. Certainly the data reveal that joint sounds can change over time,^{8,9} but these changes can even be noted during a single patient visit. Perhaps variations in interarticular pressure can explain these changes but other possibilities need to also be considered. Unusually shaped discs can sometimes maintain their positions once reestablished and therefore do not click during every opening and closing movement. The authors suggest that using the criterion of reproducibility of clicking on two of three trials likely does not have great sensitivity, which appears to be supported by other studies.

An Interincisal Distance at the Time of the Opening Click That is at Least 5 mm Greater Than at the Time of the Closing Click

The authors evaluated the jaw movements of 30 participants with ADDR and found that the distance between the opening and closing click varied greatly.¹⁰ They found that 22 of the 30 patients did present with opening and closing clicks that were greater than the 5 mm standard. Therefore, most did meet this criterion but the sensitivity was only 73 percent. The authors make a case for a

significant number of false negative results. A possible shortcoming of this study was the lack of MRI verification of the ADDR. Patients were included in this study if they presented with an opening and closing click. There was no MRI verification of the diagnosis. One must question if all the subjects actually had an ADDR or was some other intracapsular condition responsible for the joint sounds. Another consideration was regarding the evaluators; were they blinded to the diagnosis when they evaluated the mandibular movement data? If as few as two or three of these subjects had joint sounds for reasons other than ADDR, the final results may have been quite different. However, the difference would have likely added to the false positive results, making even a stronger case for the unreliability of the RDC.

Elimination of Clicking Sounds on Protrusive Opening and Closing

The authors report that their data support the idea that opening and closing the mouth in a protruded position may be helpful in differentiating ADDR from symptomatic hypermobility. Specifically, clicks associated with ADDR can be eliminated by protruding the mandible which does not appear to be the case for symptomatic hypermobility. It is interesting to note that this is the only instance when the authors compare the effectiveness of the RDC in differentiating ADDR from another disorder (symptomatic hypermobility). They state that this may be the only RDC criterion that showed some promise and only for differentiating these two disorders. As already mentioned, the diagnosis of ADDR was not verified in this study by MRI findings and therefore one must question if all patients actually had ADDR. The authors go on to state that there may be other conditions that respond to protrusive opening similar to ADDR, and this is certainly an appropriate statement (ie, superior joint space adhesions).

Only Clicking on Opening or Closing, and Clicking During Protrusive or Laterotrusive Movements

This last criterion was added in an attempt to enhance the accuracy of the RDC. When the authors used the electronic mandibular movement recording device to determine if this criterion was reliable, they found less than desirable results which resulted in a high level of false positives. As

previously mentioned, other conditions such as adhesions may lead to clicking as the condyle moves off and on the fixed disc.

Conclusions

The authors have demonstrated the difficulty of developing clinical criteria that can separate the subcategories of TMD. They explored one of the more common disorders, ADDR, which presents with clinical characteristics that are more objectively measured than many other TMD. Yet even with these objective measures, the RDC do a poor job of differentiating ADDR. This is a concern for the profession and ultimately for our patients. Therefore, we must ask ourselves, how can we improve?

There is little doubt that it would be of great benefit to our patients if the profession could develop a reliable and functional set of criteria for the many disorders we manage. These criteria could be used to further our understanding of these disorders, making our management more effective. These criteria would also assist us in clinically differentiating the various disorders, thus enhancing the accuracy of our diagnosis and allowing us to better select proper treatment. The importance of these criteria is not the issue of debate. The issue of debate is the inherent difficulty in developing these criteria. This group of musculoskeletal pain disorders we refer to as TMD is not a simple entity with consistent clinical symptoms. TMD is a large group of conditions with symptoms that overlap with other conditions. There are multiple etiologies crossing over multiple dental and medical specialties. Some of the disorders have their origin in local structures that require local interventions while others are systemic and require much different approaches. Some of these conditions are acute and can be quickly resolved, while others are chronic and require the management of complicated mechanisms in the central nervous system. Some of these conditions are painful and require immediate management while others are painless, nonprogressive and require no treatment. Appreciating these factors is the beginning of understanding why developing reliable diagnostic criteria is so very difficult, perhaps even impossible.

Within the profession we acknowledge the concept of the "art and science" of managing patients. The science is the knowledge that we need in order to continue to enhance and expand so we may better understand our patients' disorders and become

more effective with management. The art refers to the clinician's ability to inherently understand the patient's suffering and make the most appropriate clinical decisions that are in the patient's best interest. The careful blending of the art and science is fundamental for all healthcare providers. The problem that we face is that the complexity of many conditions is so great that we often cannot develop reliable criteria. This does not suggest that we should give up trying, for this would stifle our progress in the field. Both researchers and clinicians need to work hand in hand to create better methods of improving the effectiveness of the healthcare provider. Until that time, we need to acknowledge our shortcomings and provide our patients with the best care possible by using the best evidence we have (the science) with our best clinical, ie, judgment (the art) while always considering the least harmful treatment modalities.

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