Validity of the Research Diagnostic Criteria for Temporomandibular Disorders Axis I in Clinical and Research Settings

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The temporomandibular disorder (TMD) research community has been using the Research Diagnostic Criteria for TMD (RDC/TMD) since 1992, and its original developers have much to be proud of because of their widespread acceptance.[1] They have accomplished their initial goal of getting researchers to use some common language in classifying TMD patients, and by forming the International Consortium for RDC/TMD-Based Research they have enabled clinical researchers around the world to apply this system in their native languages. However, even from the very beginning there have been some doubts and concerns about the validity as well as the utility of this taxonomic system. During the past 16 years, other classification systems for TMD such as the one proposed by the American Academy of Orofacial Pain (AAOP),[2] as well as the broader headache classification system of the International Headache Society (IHS),[3] have coexisted with the RDC/TMD, but a direct confrontation was avoided by describing the former two as clinical classifications while the latter was intended for research purposes.

Among the critics of the RDC/TMD have been a number of prominent Dutch researchers, including the authors of the Focus Article.[4] Now Drs Steenks and de Wijer have consolidated their concerns by writing this insightful article, and I believe they deserve a lot of credit for their perceptive analysis as well as their forthright presentation of this critique. In my response to it, I will attempt to highlight the points that appear to me to be valid criticisms and, in a few instances, I will note some points with which I do not agree. Overall, however, I must say that their observations about the flaws of the RDC/TMD are definitely worth considering.

Before commenting further on this Focus Article, it is important to note that the original RDC/TMD proponents and several colleagues have recently conducted an extensive critical analysis of the 1992 version of this classification system, via a 5-year US National Institute of Dental and Craniofacial Research (NIDCR)-funded study that was performed in three American dental schools. This multicenter study, which was entitled "Research Diagnostic Criteria: Reliability and Validity," was started in 2001 and data collection was completed in 2006. At the International Association for Dental Research (IADR) meeting in Toronto, Canada, in July 2008, a full-day symposium on this topic was sponsored by the International RDC/TMD Consortium Network. During the morning session of that symposium, the summary results of this study were reported publicly for the first time, while the afternoon session presented critical responses invited from other prominent researchers from around the world. The papers from this conference, as well as papers from the study itself, are expected to be appearing in this and other journals in the near future, and ultimately a revised version of the RDC/TMD (version 2) will be released. However, the reader should keep in mind that this Focus Article by Steenks and de Wijer was written before all of that information was presented. Therefore, my commentary on their paper will not include any of the findings or conclusions from that 5-year multicenter study.

The Clinical Examination

Drs Steenks and de Wijer begin their criticisms of the RDC/TMD by pointing out shortcomings in the clinical examination protocols. First, there is the issue that the presence of pain is ascertained only by: *(1)* asking the patient if it hurts to open the mouth and make lateral excursions, both

assisted and unassisted; and *(2)* eliciting responses to palpation of a large number of potentially tender sites. They note that there are 20 muscular sites, but only four joint sites, which may account for the common epidemiologic report that myogenous disorders (Group I) are predominant in surveyed populations. They also wonder why other information obtainable by palpation, such as muscle tonus, presence of tissue pathology, or even provocation of other symptoms, is not considered in this protocol. Their most persuasive criticism, however, is about the failure of the RDC/TMD to require reproduction of the patient's verbal pain complaint, or to determine whether any correlation exists between reported pain and aggravation by various mandibular functions. This all fits within the classic "source versus site of pain" issue that is so important in the diagnosis of craniofacial pain,[5] because the rich innervation of this area of the body ensures a high probability of finding allodynic and heterotopic pain symptoms—especially during palpation procedures. I have long felt that this was a cardinal weakness of the RDC/TMD because they omit a key element of the process used every day to figure out who has a TMD and who has another of the 150 other possible craniofacial pain diagnoses.

These authors and other Dutch researchers have advocated the inclusion of temporomandibular joint (TMJ) loading procedures (orthopedic tests) as another useful element to distinguish between TMD and other orofacial pains,[6] so naturally they are critical of this not being part of the RDC/TMD. In addition, they wonder, as I do, if there are screening procedures already in place to rule out specific TMJ pathologies FIRST before using the RDC/TMD protocols to subdivide a TMD patient population.

Diagnostic Algorithms

According to the published criteria, patients are classified into Groups I, II, and III (with eight subgroups) following the clinical examination. Steenks and de Wijer find some faults within each subgroup, as would be expected from the previous criticisms. Using three out of 20 positive muscle palpation sites (and only one on the ipsilateral side) as a cutoff for Group I (muscle disorders) seems a bit arbitrary. For Group II (internal derangements), the RDC/TMD does not mention the degree of jaw opening when clicking occurs, nor whether TMJ clicking can occur under other conditions than just during opening or closing the mouth. Finally, the lack of orthopedic loading tests means that Group III (arthralgia) diagnoses are being made only on the basis of reported pain and joint palpations, which can result in false positives. All of this leads into a discussion of reliability and validity of the RDC/TMD, which is a topic I will leave for other commentators on this Focus Article.

Use of the RDC/TMD in Clinical Settings

While the original RDC/TMD were described in 1992 as a system to be used by researchers, the website of the International RDC/TMD Consortium Network in 2004 advocated its use in clinical situations as well.[7] Steenks and de Wijer find this alarming from the standpoint of the questionable validity of the criteria themselves, as well as the correctness of using such diagnoses in the "real world." They point out that patients often have multiple TMD diagnoses simultaneously, and I would add that they also might have comorbid conditions such as fibromyalgia and other painful disorders.

The authors also wonder what the effect would be on diagnoses made in clinical studies that are conducted with, for example, auscultation added to the RDC/TMD protocol. Also, what about authors who use other TMD classification systems to report their findings? Should they be excluded from publication because they choose not to use this rigid system? Given the imperfections of the RDC/TMD, these certainly are reasonable questions. In the end, these authors clearly state that they prefer the use of the AAOP and IHS classification systems in their clinical settings, mainly because they more accurately separate patients into clinically meaningful TMD subgroups.

Recommendations for Updates of the RDC/TMD

In this section of their paper, Steenks and de Wijer offer a number of very sensible suggestions to update and improve the RDC/TMD and, in fact, the 5-year study mentioned earlier has come to many similar conclusions. One of their proposed changes is to modify the AAOP diagnostic flowchart to include an Axis III that deals with prognostic factors, but I believe that goes beyond the scope of the rest of this paper. However, these authors deserve credit for their insightful analysis of the original RDC/TMD system, and I believe

the following suggestions they offer should be seriously considered:

1. Screening protocols must be spelled out for initial differential diagnostic procedures to be used to rule out specific TMJ pathologies and other orofacial pain diagnoses BEFORE any patient gets included in a TMD study.
2. Other TMD diagnostic categories such as dislocation, hypermobility, and more subtle disc displacement phenomena need to be added and, in addition, allowance needs to be made for the existence of multiple diagnoses in one patient.
3. Examiners must determine whether cross-correlations between the history and examination findings exist in order to confirm a diagnosis of TMD.
4. Orthopedic tests, as described by these and other authors, need to be included in the examination of TMJ conditions.
5. Palpation should be used to rule out pathology and to describe tissue qualities (eg, muscle tonus), not just to find tender spots.
6. Palpation protocols should be altered to eliminate unreachable or unclear muscle palpation sites, and a better balance between the number of muscle and joint sites examined should be established.

In discussing the issue of palpation, Steenks and de Wijer make an important point about the overemphasis on calibrating gold-standard examiners without sufficient regard for the meaning of their palpation findings. They summarize their opinion on this topic quite well in the following sentence: "The use of a gold-standard examiner does not solve the validity issues."

Problems of Generalizabilty Arising from Case Definition Problems

This paper concludes with a critical analysis of a major prospective study published by members of the Seattle group that spearheaded the development of the original RDC/TMD. Their paper, entitled "Predictors of onset of facial pain and temporomandibular disorders in early adolescence," purports to tell us what kinds of baseline clinical findings in children will "predict" who gets TMD.[8] However, as Steenks and de Wijer correctly observe, the authors should consider whether they really diagnosed TMD in about 7% of the children 11 to 14 years of age, because they relied on the RDC/TMD to detect and classify them. What if some of the children were migraineurs, who would probably test positive for multiple site palpations? What if they met the RDC/TMD criteria but actually had another underlying condition? And perhaps most importantly, should we assume that the discovery and classification of people in the community as having some type of TMD means that they do or will need treatment? Moreover, does analysis of their "predictors" tell us anything about prevention of later development of a TMD? Having raised these issues many times in my own work, I am very sympathetic to this argument; in fact, I believe a major fault in much of the published epidemiologic literature on TMD is the high number of "positive" findings reported based on the discovery of various signs and symptoms, without regard for their clinical significance.

Conclusions

At some points in their paper, Steenks and de Wijer seem to be saying that the RDC/TMD should be improved to the point where they COULD be used in a purely clinical setting, but I think that is not achievable regardless of how much the criteria are modified. As Laskin has suggested recently,[9] the term TMD itself could be a barrier to establishing the kinds of operational definitions that the IHS has produced for classification of headaches. As he points out, the orthopedic world does not diagnose patients with any other joint problems as having, for example, knee disorders or shoulder disorders, so why do we need a term like temporomandibular disorders? Also, many authors and lecturers seem to regard TMD as a single entity (somewhat like the old TMJ syndrome), so they use terminology like "TMD is a musculoskeletal condition" or "TMD should be treated with," all of which simply adds to the confusion. Instead, Laskin proposes using conventional orthopedic terms to name all of the pathologic and functional conditions that could possibly affect the TMJ and masticatory muscles. However, expecting this to happen may be an unrealistic goal in a world where the term TMD has become so firmly entrenched. Therefore, at the very least, a more realistic and expanded version of the research diagnostic criteria must be produced in order to make future clinical studies more applicable to the "real world." Hopefully, the contributions of Steenks and de Wijer will add important ingredients to this ongoing process.

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