



ACCURACY STUDY

Accuracy study of the main screening tools for temporomandibular disorder in children and adolescents



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KEYWORDS

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Summary The aims of the present study were to assess the degree of sensitivity and specificity of the screening questionnaire recommended by the American Academy of Orofacial Pain (AAOP) and the patient-history index proposed by Helkimo (modified by Fonseca) and correlate the findings with a clinical exam. All participants answered the questionnaires and were submitted to a clinical exam by a dentist who had undergone calibration training. Both the AAOP questionnaire and Helkimo index achieved low degrees of sensitivity for the detection of temporomandibular disorder (TMD), but exhibited a high degree of specificity. With regard to concordance, the AAOP questionnaire and Helkimo index both achieved low levels of agreement with the clinical exam. The different instruments available in the literature for the assessment of TMD and examined herein exhibit low sensitivity and high specificity when administered to children and adolescents stemming from difficulties in comprehension due to the age group studied and the language used in the self-explanatory questions.

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Introduction

Temporomandibular disorder (TMD) is a term employed for functional alterations related to the temporomandibular joint, muscles of mastication and associated structures (Ebrahimi et al., 2011). Joint sounds, limited range of motion or deviation during the function of the mandible, pain, facial deformities and headache are among the symptoms of this disorder (Catanzariti et al., 2005; Velez et al., 2007).

Approximately 34.7% of adolescents are affected by TMD (Ebrahimi et al., 2011), whereas the prevalence among children is around 23.7% (Tecco et al., 2011). Considering the multifactorial aetiology of this disorder, a number of neuromuscular, psychological and anatomic aspects should be evaluated for the establishment of the diagnosis (Okeson, 2008).

Different assessment tools have been employed for the assessment of TMD, such as questionnaires (Manfredi et al., 2001), patient-history indices (Bevilaqua-Grossi et al., 2006; Fonseca et al., 1994), clinical indices and diagnostic criteria (Cavalcanti et al., 2010; de Lucena et al., 2006; Manfredini et al., 2011). Evaluation methods allow the standardized classification of the severity of the disorder and the categorisation of signs and symptoms so that the diagnosis can be properly established (Manfredini et al., 2006; Miller et al., 2000; Perillo et al., 2011).

The aims of the present study were to assess the degree of sensitivity and specificity of the screening questionnaire for orofacial pain and TMD recommended by the American Academy of Orofacial Pain (AAOP) (Manfredi et al., 2001) and the patient-history index proposed by Helkimo (modified by Fonseca et al., 1994) for individuals between six and 18 years of age and correlate the findings with a specific clinical exam for the diagnosis of TMD using the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) (Manfredini et al., 2006).

Methods

A cross-sectional study was carried out with individuals between six and 18 years of age enrolled at the *Instituto Rogacionista* in Sao Paulo, SP, Brazil. The inclusion criteria were age between six and 18 years, presence of the 2nd primary molar and 1st permanent molar in participants between six and 10 years of age and the presence of the 1st permanent molar in participants between 11 and 18 years of age. Individuals under medical, psychological or dental treatment and those with dentofacial deformities were excluded. This study was carried out in compliance with the norms that regulate studies involving human subjects contained in Resolutions n°196/96 and 251/97 of the Brazilian National Health Council and was approved under process number n°233,931/2009. The guardians of the children and adolescents signed statements of informed consent.

The dentist underwent a calibration and training exercise. A researcher experienced with the administration of the questionnaires served as the gold standard in

this phase. The training model proposed by the International Consortium for RDC/TMD-Based Research was used for the clinical exam, which was performed on five participants on three separate occasions to obtain a standard and avoid errors on the part of the examiner.

All participants answered the AAOP questionnaire, which is composed of 10 self-explanatory questions with "yes" and "no" answers on the most frequent signs and symptoms of orofacial pain and TMD (Appendix 1), and the Helkimo patient-history index (modified by Fonseca) (Appendix 2), which is made up of 10 self-explanatory questions with "yes" and "no" answers based on different symptoms of masticatory dysfunction (subjective symptoms).

The participants were then submitted a clinical exam by a single calibrated examiner (dentist) using the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD). This measure is divided into two axes (I and II). Axis I is used to identify the complex interaction between physical and psychological aspects of chronic pain and allows a reliable measure of signs and symptoms of TMD through a clinical exam. Axis II determines associated psychological and psychosocial factors through the administration of a questionnaire. In the present study, the participants were only submitted to the clinical exam (Axis I), which consisted of an extra-oral and intra-oral inspection of the teeth and occlusion, palpation of the sternocleidomastoid, temporal, masseter, digastric and medial pterygoid muscles of the temporomandibular joint and an analysis of mandibular range of motion with the use of a digital calliper (Mytutoio®) for the measurement of maximal mouth opening and lateral movements. The following were also analysed: joint sounds (clicking in temporomandibular joint upon opening and/or closing the mouth); dental wear (occlusal or incisal) indicative of possible parafunctional habits, such as teeth grinding; direct report regarding individual stress status; recent history of microtrauma in the orofacial region; and the investigation of frequent headache, facial pain, fatigue/difficulty during mastication, bruxism, psychological aspects of the child, digit sucking, pacifier sucking and nail biting.

The data were organized into tables and graphs and statistically treated. Frequencies and percentages were calculated for the results of the AAOP questionnaire, Helkimo Index (modified by Fonseca) and clinical exam regarding the presence or absence of TMD. Contingency tables were constructed for the determination of sensitivity, specificity, positive predictive value and negative predictive value, considering the clinical exam as the gold standard. Using these same tables, Kappa concordance coefficients were determined. All analyses were performed using the SAS program for Windows, v.9.2.

Results

Among the 110 children analysed, 51 (46.3%) were female and 59 (53.6%) were male. Mean age was 8.18 years. Table 1 displays the frequency and percentage of patients with and without TMD, as determined by the AAOP

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