J Pediatr (Rio J). 2014;90(3):279–285

Jornal de Pediatria
www.jped.com.br

ORIGINAL ARTICLE

Radiographic adenoid evaluation – suggestion of referral parameters☆

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Received 4 June 2013; accepted 4 September 2013
Available online 5 February 2014

KEYWORDS
Mouth breathing;
Diagnosis;
Adenoidectomy

Abstract
Objective: this study aimed to evaluate the usefulness of current radiographic measurements, which were originally conceived to evaluate adenoid hypertrophy, as potential referral parameters.
Methods: children aged from 4 to 14 years, of both genders, who presented nasal obstruction complaints, were subjected to cavum radiography. Radiographic examinations (n = 120) were evaluated according to categorical and quantitative parameters, and data were compared to gold-standard videonasopharyngoscopic examination, regarding accuracy (sensitivity, negative predictive value, specificity, and positive predictive value).
Results: radiographic grading systems presented low sensitivity for the identification of patients with two-thirds choanal space obstruction. However, some of these parameters presented relatively high specificity rates when three-quarters adenoid obstruction was the threshold of interest. Amongst the quantitative variables, a mathematical model was found to be more suitable for identifying patients with more than two-thirds obstruction.
Conclusion: this model was shown to be potentially useful as a screening tool to include patients with, at least, two-thirds adenoid obstruction. Moreover, one of the categorical parameters was demonstrated to be relatively more useful, as well as a potentially safer assessment tool to exclude patients with less than three-quarters obstruction, to be indicated for adenoidectomy.

☆ Please cite this article as: Feres MF, Hermann JS, Sallum AC, Pignatari SS. Radiographic adenoid evaluation – suggestion of referral parameters. J Pediatr (Rio J). 2014;90:279–85.

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0021-7557
http://dx.doi.org/10.1016/j.jped.2013.09.004

PALAVRAS-CHAVE
Respiração bucal;
Diagnóstico;
Adenoidectomia

Avaliação radiográfica da adenoide – sugestão de parâmetros de referência

Resumo

Objetivo: o objetivo deste estudo foi de investigar a utilidade de medidas radiográficas destinadas à avaliação da tonsila faríngea a serem utilizadas como potenciais parâmetros de encaminhamento.

Métodos: crianças de quatro a 14 anos, de ambos os gêneros, que apresentavam queixas referentes à obstrução nasal foram submetidas à radiografia do cavum. Os registros radiográficos (n = 120) foram avaliados de acordo com parâmetros categóricos e quantitativos, e dados resultantes foram comparados ao exame padrão-ouro de videonasofaringoscopia, em relação às suas taxas de acurácia (sensibilidade, valor preditivo negativo, especificidade e valor preditivo positivo).

Resultados: os parâmetros radiográficos categóricos apresentaram baixa sensibilidade para a identificação de pacientes portadores de ⅔ de obstrução do espaço coanal. No entanto, alguns destes parâmetros apresentaram especificidades relativamente altas quando ¾ de obstrução coanal era o ponto de corte de interesse. Dentre as variáveis quantitativas, um modelo matemático se mostrou mais adequado para identificar pacientes com mais de ⅔ de obstrução coanal.

Conclusão: este modelo demonstrou, assim, ser potencialmente útil como método de rastreamento para identificação de pacientes com pelo menos ⅔ de obstrução adenoidiana. Além disso, um dos parâmetros categóricos analisados demonstrou ser relativamente mais útil e potencialmente seguro para eliminar pacientes queixosos com menos de ¾ de obstrução a serem indicados à adenoidectomia.

Introduction

Mouth breathing is highly prevalent among children of all ages,[1–3] and it is frequently caused by obstructive hypertrophied adenoids.[3–5] Even though pediatricians are responsible for most of the child referrals to otolaryngologic secondary care, diagnosis agreement between both levels of care is extremely low in cases of adenoid enlargement.[6] Since pediatricians rarely perform videonasopharyngoscopic examination (VNP), but cavum X-ray is the most frequently required otolaryngologic complementary exam in the public health system,[7] it is justifiable to investigate the usefulness of cavum X-ray on adenoid assessment.

Although this topic has been extensively debated over the years,[4,8–12] the usefulness of lateral cavum X-ray is still unclear. This uncertainty might be related to the absence of comprehensive studies that simultaneously investigate a considerable number of radiographic parameters.[13,14]

Therefore, the aim of this study was to evaluate current radiographic adenoid assessment methods in comparison to gold standard VNP examination, and to present potentially useful radiographic referral methods.

Methods

This was a cross-sectional methodological study, and was approved by the institutional ethics review board (protocol 0181/08).

In order to compose the study sample, 170 children from a public pediatric otolaryngologic referral center, ages ranging from 4 to 14 years, were invited to participate. Of these, 43 refused to participate. An informed consent was obtained from all the participants, after detailed description of the procedures and proper explanation of the study objective, risks, discomforts, and benefits.

In order to meet the inclusion criteria, patients must have presented complaints of nasal obstruction or oral breathing suspected to be caused by adenoid hypertrophy. Children with congenital syndromes or head and neck malformations were excluded. Subjects with acute infection of the respiratory tract or with history of previous adenoidectomy were also excluded.

Initially, all children were submitted to a radiographic exam of the cavum, which was performed by a single radiology specialist. Focus-film distance was 140 cm, and X-ray exposure settings were 70 kV, 12 mA, for 0.40 to 0.64 seconds. During radiographic examination, patients were standing, and instructed to breathe exclusively through the nose and to keep their lips gently sealed. Central X-ray beam was directed toward the nasopharyngeal anatomic area. Radiographic exams showing elevation of the soft palate or significant rotation of the head were discarded.

Lateral radiographies were number-coded and hand-traced by one of the researchers, who was unaware of the subjects' identities as well as their clinical conditions and complaints. The examiner performed several radiographic categorical and quantitative measurements (Table 1,[15–18] Figure 1), which were already proven to be satisfactorily reproducible.[19] Tracings were performed with a negatoscope upon acetate films. Linear measurements were determined with a digital caliper (Starret™ 799A-8/200).