Assessment of lateral cephalometric diagnosis of adenoid hypertrophy and posterior upper airway obstruction: a systematic review

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CRD summary
This review assessed lateral cephalograms for diagnosing enlarged adenoids and obstructed posterior nasopharyngeal airways in children and adolescents. The authors concluded that cephalograms reliably image adenoids, but not nasopharyngeal size, and are most useful when used as a screening tool to determine the need for more rigorous follow-up. These conclusions appear likely to be reliable.

Authors' objectives
To assess the validity of lateral cephalograms in diagnosing enlarged adenoids and obstructed posterior nasopharyngeal airways in children and adolescents.

Searching
MEDLINE, EMBASE, the Cochrane Library, Web of Science and LILACS were searched to May 2005; the search terms were reported. Handsearches of references were also carried out. No language restrictions were applied.

Study selection
Study designs of evaluations included in the review
Diagnostic studies that employed a reference standard were eligible for inclusion in the review.

Specific interventions included in the review
Studies that used lateral cephalograms, or lateral radiographs comparable to a standardised conventional lateral cephalogram, and took cephalometric measurements of the adenoids or the immediate surrounding area in the nasopharyngeal lumen were eligible for inclusion in the review.

Reference standard test against which the new test was compared
Studies that used an alternative diagnostic method were eligible for inclusion. The following reference standards appear to have been specifically considered: cephalometric comparison, nasal resistance, clinical examination, post-surgery adenoid measurement, nasoendoscopy and 3D-imaging. Of these, endoscopy, post-surgery measurement, clinical questionnaires, cephalometric comparison and nasal resistance were used in the included studies.

Participants included in the review
Studies of children and adolescents were eligible for inclusion. Studies of children and adolescents aged between 5 and 17 years, and with a group who had posterior nasopharyngeal obstruction, were considered to have adequate selection criteria.

Outcomes assessed in the review
Studies that reported useful statistical comparisons were eligible for inclusion. The outcomes reported in the review included adenoid area, linear measures and degree of nasopharyngeal obstruction.

How were decisions on the relevance of primary studies made?
Two reviewers independently assessed the references retrieved, and full papers were ordered for references selected by either reviewer. Two reviewers then independently assessed studies for inclusion in the review and any disagreements were resolved by discussion.

Assessment of study quality
Validity was assessed using a modified form of a previously validated scoring process. This assessed factors related to
study design (e.g. adequacy of selection process, sample size, prospective design, use of an appropriate control group), factors related to the reference standard employed, and factors related to the data analysis (e.g. use of appropriate statistical tests and adjustment for confounding variables). The authors did not state how the validity assessment was performed.

Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction. Data were extracted on outcomes such as adenoid area, linear measures and degree of nasopharyngeal obstruction.

Methods of synthesis
How were the studies combined?
The studies were combined in a narrative, although it appeared that summary estimates for correlation coefficients were also calculated. However, no details of this process were reported.

How were differences between studies investigated?
Details of differences between the studies were discussed in the narrative synthesis.

Results of the review
Eleven studies were included in the review.

Five studies were considered to be of useful quality, while six were lower ranked.

A subjective evaluation of the X-ray was found to have a reasonable correlation (r) with actual diagnosis (r: 0.66 to 0.71). This was also found to be the case for the correlation of various cephalometric area measures of the adenoid with actual adenoid size (r: 0.60 to 0.88). However, there was no consensus on the most important cephalometric landmarks, with each study employing different ones.

Detailed results were presented for the majority of the included studies.

Authors’ conclusions
Cephalograms appear to reliably image adenoids, but are less successful at diagnosis of nasopharyngeal size. Their most useful role is as a screening tool to determine the need for more rigorous follow-up.

CRD commentary
The review question was clear, but the inclusion criteria were not always stated clearly. The authors searched a number of relevant databases and did not apply any language restrictions. This reduces the likelihood that some relevant studies might have been omitted from the review, although searches for unpublished studies were not reported. The authors used appropriate methods to minimise bias and error when selecting studies for the review, but they did not report doing so in their assessment of validity or the data extraction.

The decision to employ a narrative synthesis seems appropriate given the clinical and methodological heterogeneity of the studies, but it is not clear what process was employed to derive the summary statistics presented. The authors’ conclusions appear to represent the results of the review, and appear likely to be reliable.

Implications of the review for practice and research
Practice: The authors recommended that clinicians look for multiple deviant measures of adenoid size instead of one definitive quantification.

Research: The authors stated that studies with adequate analysis of sensitivity and specificity, including receiver
operating characteristic curves, should be performed, with 3D-imaging used as the reference standard.

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