Review: ear pain and a cloudy, bulging, or distinctly immobile tympanic membrane appear to help diagnose acute otitis media in children

Rothman R, Owens, Simel DL. Does this child have acute otitis media? *JAMA* 2003;**290**:1633–40.

Clinical impact ratings GP/FP/Primary care ★★★★★☆☆ Emergency medicine ★★★★★☆☆ Paediatrics ★★★★★☆☆

Q In children, how accurate are symptoms and signs for diagnosing acute otitis media (AOM)?

METHODS

Data sources: English language studies were identified by searching Medline (1966 to May 2002), scanning bibliographies of relevant studies, and searching general and specialty textbooks.

Study selection and assessment: studies were selected if they examined the accuracy of symptoms and signs in the diagnosis of AOM in children. Studies on the diagnosis of persistent otitis media with effusion were excluded. Studies were assessed for methodological quality including whether there was an independent blinded comparison of signs or symptoms against a criterion standard.

Outcomes: sensitivity, specificity, and likelihood ratios.

MAIN RESULTS

6 studies met the selection criteria. 1 study (43 children) examined precision and found only a fair overall agreement (kappa statistic 0.30) on diagnosis of AOM between paediatric residents and otolaryngologists. 4 studies (total 965 children; age range 0 to 15 y) examined the accuracy of symptoms; in these studies, clinical diagnosis was used as the criterion standard. Using clinical diagnosis as the criterion standard, the presence of ear pain and parental suspicion of AOM may be useful for diagnosing AOM. 1 study (2911 children; age range 6 mo to 2.5 y) examined the accuracy of signs; in this study, tympanocentesis was used as the criterion standard. This study reported the accuracy of signs on pneumatic otoscopy for diagnosing AOM in children (table).

CONCLUSION

In children, ear pain and a cloudy, bulging, or distinctly immobile tympanic membrane appear to be helpful for diagnosing acute otitis media.

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Commentary

To decrease the development of bacterial resistance to antimicrobials, their use should be minimised. To achieve this goal in paediatric infections would require a decrease in use of antimicrobial therapy for otitis media. In their systematic review, Rothman *et al* analysed the data of the accuracy of symptoms and signs as diagnostic tests for acute otitis media. They agreed with the conclusions of the separate surveys that no symptoms exist that are independently useful in diagnosing acute otitis media in children. Thus, more emphasis should be put on the diagnostics of otitis media. Tympanometry is a reliable diagnostic aid¹ and is especially useful now as we have given up doing tympanocentesis in AOM. An external diagnostic tool is needed and pneumatic otoscopy, although moderately accurate for AOM (table), may be difficult to teach.

One reason why physicians prescribe antimicrobials for children is their assumption of parental expectations of antibiotics. Physicians often overestimate the parents' expectations, and change in parental expectations does not change physicians' prescribing behaviour.^{2,3} Providing a contingency plan to parents who expect antibiotics for their children has been shown to improve parental satisfaction without antimicrobial prescription.² Thus, parents should not be blamed, and we physicians urgently need to stop over prescribing antimicrobials.

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1 Koivunen P, Alho OP, Uhari M, *et al*. Minitympanometry in detecting middle ear fluid. *J Pediatr* 1997;**131**:419–22.

2 Mangione-Smith R, McGlynn EA, Elliott MN, *et al*. Parent expectations for antibiotics, physician-parent communication, and satisfaction. *Arch Pediatr Adolesc Med* 2001;**155**:800–6.

3 Wheeler JG, Fair M, Simpson PM, *et al*. Impact of a waiting room videotape message on parent attitudes toward pediatric antibiotic use. *Pediatrics* 2001;**108**:591–6.

Accuracy of signs on pneumatic otoscopy for diagnosing acute otitis media in children*

Sign	Result	Unadjusted +LR	Adjusted +LR†
Colour	Cloudy colour	11	34
	Distinctly red colour	2.6	8.4
	Slightly red colour	0.4	1.4
	Normal colour	0.1	0.2
Position	Bulging position	20	51
	Retracted position	1.3	3.5
	Normal position	0.4	0.5
Mobility	Distinctly impaired mobility	8.4	31
	Slightly impaired mobility	1.1	4.0
	Normal mobility	0.04	0.2

*+LR defined in glossary.

†+LRs adjusted to correct for verification bias.