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Evaluation of Iranian pediatric specialists' attitude and knowledge regarding approach to patients with acute otitis media

Babak Ghalehbaghi[1], Navid Mohammadi[2], Alimohamad Asghari[3], Alireza Ahmadvand[4], Yasaman Moradi[5], Kamran Kamrava[6], Mir Abolfazl Motiei[7]

Department of Community Medicine, Faculty of Medicine, Tehran University of Medical Sciences, Tehran, Iran.

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Abstract

Background: The ministry of health and medical education of Iran and many other countries advice physicians to use this guideline for diagnosis and treatment of acute otitis media (AOM), but there is not any evaluation of effectiveness and obedience of this guideline, so the aim of this study was to evaluate the attitude of pediatricians, the most important group that interfere with these patients in treatment of acute otitis media.

Methods: A total of 120 anonymous surveys were mailed to 120 pediatrician in Tehran (Iran) to evaluate pattern of diagnosis and treatment of AOM in these physicians. Age, gender, place of work, attitude of diagnosis and treatment were asked by anonymous survey.

Results: Sixty-two completed surveys were received, for a response rate of 51%. There was no significant difference between responders in these survey and scenarios, according to sex, age, practice setting, graduation year or the number of AOM patients visiting each month.

Conclusion: Our study seems to add new insights to the previous literature on management of AOM according to guideline. We can assess the impact of guidelines on the usual practice of practitioners in evidenced-based management of AOM.

Keywords: Acute otitis media, Pediatrician, Attitude, Knowledge.

Introduction

Otitis media is a general term for middle ear inflammation and may be classified clinically as either acute otitis media (AOM) or otitis media with effusion (1). AOM is one of the most common infections in young children (2) and a major cause for outpatient visits in childhood (3,4). Although every child is experiencing four episodes of AOM during the first 6 years of his life (on average) (5) and 14% of all antibiotic prescriptions in children is for this infection (6), the proper diagnosis and treatment of AOM is stil l a concern.

Use and overuse of antibiotics is associated with the development and spread of resistant bacteria (7); a problem continuing to gain attention from national organizations as a significant threat to the public health (8). It is important to avoid unnecessary antibiotic prescription in children because they repre-

1. Allergist and Clinical Immunologist , Fahmideh Hospital, Shahid Beheshti University of Medical Sciences, ghalehbaghi@gmail.com
2. **(Corresponding author)** Assistant professor in community medicine, Department of community medicine, Faculty of medicine, Tehran University of Medical Sciences, Tehran, Iran. nvmohammadi@sina.tums.ac.ir,
3. Assistant professor of otolaryngology, ENT, Head & Neck Department and Research Center, Hazrat Rasoul Akram Hospital, Tehran University of medical sciences, farshad.asghari@gmail.com
4. PhD Candidate of Epidemiology, Researcher, Knowledge Utilization Research Center, Tehran University of Medical Sciences, Tehran, Iran , ahmadvand.ar@gmail.com
5. General Practitioner, Tehran University of medical sciences, yasaman.moradi7@yahoo.com
6. Assistant professor of otolaryngology, ENT, Head & Neck Department and Research Center, Hazrat Rasoul Akram Hospital, Tehran University of medical sciences, skkamrava@yahoo.com
7. Medical student, Student Research committee, Tehran University of Medical Sciences, dr.motiei86@gmail.com

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sent a large reservoir for resistant organisms (9).

Since 1997, several systematic reviews, government reports and evidence-based clinical practice guidelines have been published in developed countries covering the management of otitis media (10- 15). In 2004, the American Academy of Family Physicians and the American Academy of Pediatrics jointly issued guidelines with criteria for making the diagnosis, endorsing an observation option for those without severe disease, and advocating more aggressive pain management (16). These guidelines were approved by Iranian ministry of health for pediatricians' practice. However, there is a little information regarding impacts of these guidelines on the diagnosis and treatment of AOM by pediatricians. On the other hand, there is no systematic approach for teaching and using practice guidelines in routine medical education and daily practice in Iran, and such experiences are often individual and transient.

The aim of this study was to evaluate the attitude of a group of Iranian pediatricians in approach to the patients with acute otitis media.

Methods

In a cross-sectional survey from February 2009 to March 2010, anonymous questionnaires were mailed to 120 pediatricians in Tehran to evaluate their approach to management of AOM. The survey tried to assess the knowledge and practice of physicians regarding management of AOM cases based on hypothetical patients' medical histories and physical examination results (Table 1). These cases were developed by a panel of experts consisting of general practitioners and academic pediatricians and otorhinolaryngologists. Face and content validities of the questionnaire were determined by another expert panel and its reliability was measured twice by test- retest method. Cronbach's alpha finally reported about 86%.

In the first part, physicians were asked by eight consecutive cases to determine whether they were sure about the diagnosis or not. In next section, six scenarios were provided to choose between "observation only" and "antibiotic prescription" options in either "definite" or "probable" AOM cases. In final section, the questionnaire were offering two cases of AOM, three different treatment conditions, and seven proposed antibiotic regimens plus an observation option. This part was designed to assess physicians' adherence to guidelines regarding antibiotic therapy, i.e. choosing the best time to start antibiotics and the most appropriate regimen for each patient.

A written informed consent was taken from participants beforehand. Study protocol was approved by the Tehran University of Medical Sciences (TUMS) Ethics Committee.

Statistical analysis

Data analysis was performed by using SPSS package (version 16) for description and comparison of different variables. *Kolmogorov-Smirnov* test, independent samples *t-student* test and *Mann-Whitney U* test were used for this purpose wherever they were appropriate.

Results

Sixty two out of 120 questionnaires were completed by physicians (response rate of 51%). Demographic characteristics of physicians are shown in Table 2.

About half of the physicians (50.8%) believed they had received proper education about approach to AOM in medical schools. This rate was increased to 74.2% during residency period. There were no significant relationships between the proportion of physicians whom had received proper education and age, place of practicing and its duration. However, a higher proportion of female pediatricians believed they had not received proper education during medical school period (p=0.038). The attitude of physicians regarding diagnosis of AOM based on 8 sample cases is showed in table 3. A higher proportion of pediatricians who believed they had received proper education during

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Table 1. AOM cases and scenarios developed and presented consecutively to Pediatricians practitioners in a three-part survey to assess their knowledge and practice.

Part 1: "certain" or "uncertain" on the diagnosis of AOM based on these scenarios		
Case Order	Medical History	Physical Examination
1	A 5-year-old boy with acute onset of severe otalgia	A body temperature of 38.5°C distinct redness of the Tympanic membrane (TM) Fluid in the middle ear
2	A 15-year-old girl with moderate otalgia, and a history of 39°C body temperature in recent five days	Reddened TM Effusion in the middle ear
3	A 3-month-old infant with severe restlessness from 2 days ago	Body temperature of 39.5°C Red TM on otoscopy without any fluid collection in the middle ear
4	A 25-year-old man complaining of acute onset of severe otalgia	Body temperature of 38.5°C since previous 2 days Red and bulged TM
5	A 5-month-old infant with sever restlessness and a history of body temperature of 39.5°C in the recent 12 hours His mother complains of diarrhea and rhinorhea	Red TM on otoscopy
6	A 10-month-old boy with restlessness and body temperature of 38°C since yesterday and a history of touching his right ear	A reddened and bulged TM on otoscopy
7	A restless 18-month-old girl with body temperature of 39°C from yesterday who touches her left ear during examination	An equivocal otoscopic examination
8	A 32-year-old woman with a history of upper respiratory tract infection within the last week; she complains of dull pain in her right ear	Annular redness around TM on otoscopic examination
Part 2: To choose between "observation" and "antibiotic prescription" options		
1	An infant younger than 6 months with fever less than 39°C	
2	An infant younger than 6 months with fever more than 39°C	
3	A 6-month- to 2-year-old child with fever less than 39°C	
4	A 6-month- to 2-year-old child with fever more than 39°C	
5	A child older than 2 years with mild otalgia and fever less than 39°C	
6	A child older than 2 years with mild otalgia and fever more than 39°C	
Part 3: Adherence to guidelines regarding choosing the best time to start antibiotics and the most appropriate regimen for each patient		
Cases	1. AOM with body temperature of less than 39°C and/or mild otalgia 2. AOM with body temperature of more than 39°C and/or severe otalgia	
Treatment situations	1. Initiate antibiotic therapy at first visit 2. Observe the patient and postpone antibiotic therapy for 48-72hr after observation if symptoms did not improve 3. Change to an alternative antibiotic regimen after 48-72hr from administration of the first antibiotic regimen if it has not evoked a proper response	
Antibiotic regimens	Low-dose Amoxicillin (40-50 mg/kg/day) High-dose Amoxicillin (80-90 mg/kg/day) Low-dose Co-Amoxiclav (40-50 mg/kg/day) High-dose Co-Amoxiclav (80-90 mg/kg/day) Azithromycin Cefuroxime Ceftriaxone	
	Observation without immediate antibiotic therapy	

residency period could diagnose the fifth case correctly (p=0.003), and a higher proportion of female pediatricians could do the sixth one correctly (p=0.019). There was no other significant difference between respondents.

About ¼ of the physicians (26%) reported they prefer to observe the patients (without antibiotic therapy) who have definite diagnosis of AOM and others (74%) agreed to start antibiotic therapy on initial visit. Suggested decisions regarding antibiotic therapy in definite and probable cases of AOM are showed in Table 4.

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In terms of approach to the six scenarios on therapeutic decisions, there was no significant difference according to pediatricians' sex, age, practice setting, graduation year or the number of AOM patients visiting each month.

In the final section of the questionnaire, only one out of seven respondent pediatricians (14.5%) chose an appropriate antibiotic (Amoxicillin 80-90 mg/kg/day) as initial treatment for patients with temperature < 39°C and mild otalgia (first case) while 25.8% chose low dose Co-Amoxiclav (40-50mg/kg/day); 14.5% chose low dose Amoxicillin (40-50mg/kg/day) and 37.1% chose observation without immediate antibiotic therapy.

For initial treatment of the patients with temperature > 39°C and/or severe otalgia (second case), 21% chose an appropriate antibiotic (Co-Amoxiclav 80-90 mg/kg/day) while 14.5% chose low dose Co-Amoxiclav (40-50mg/kg/day), 40.3 % chose high dose Amoxicillin (80-90mg/kg/day), and 9.7% chose low dose Amoxicillin (40-50mg/kg/day).

Table 2. Demographic characteristics of 62 Pediatricians participated in the survey

Age, yr (Median [range])	43(30-70)
Interquartile range	39-59.5
Sex (n [%])	
Male	39 (63)
Female	23 (37)
Practice setting (n[%])	
Hospital	9 (14.4)
Clinic	4 (6.2)
Office	18 (28.8)
Hospital & clinic	6(9.6)
Hospital & office	13 (20.8)
Office & clinic	5 (8.0)
Hospital & clinic & office	7 (11.2)
Unknown	12(19.3)
Duration of practice (Median [range])	12(1-39)
Interquartile range	7-27

For treatment of the first case after 48-72h observation without improvement, only 21.1% chose an appropriate antibiotic (Amoxicillin 80-90mg/kg/day) and others had different options for prescription [24.6% chose low dose Co-Amoxiclav (40-50mg/kg/day) and 17.5 % chose low dose Amoxicillin (40-50mg/kg/day)].

Table 3. Percentage otolaryngologist diagnosed 8 hypothetical AOM cases with certainty.

Medical History and physical examinations of 8 hypothetical cases	Certain diagnosis	Probable diagnosis
A 5-year-old boy with acute onset of severe otalgia; a body temperature of 38.5°C; distinct redness of the tympanic membrane (TM); and fluid in the middle ear	*93.4%	6.6%
A 15-year-old girl with moderate otalgia; a history of 39°C body temperature in recent five days; reddened TM; and effusion in the middle ear	*55.7%	44.5%
A 3-month-old infant with severe restlessness from 2 days ago; body temperature of 39.5°C; reddened TM on otoscopy without any fluid collection in the middle ear	*68.9%	31.1%
A 25-year-old man complaining of acute onset of severe otalgia; body temperature of 38.5°C since previous 2 days; reddened and bulged TM	*91.8%	8.2%
A 5-month-old infant with sever restlessness and a history of body temperature of 39.5°C in the recent 12 hours; his mother complains of diarrhea and rhinorhea; reddened TM on otoscopy	13.1%	*86.9%
A 10-month-old boy with restlessness; body temperature of 38°C since yesterday and a history of touching his right ear; a reddened and bulged TM on otoscopy	*57.4%	42.6%
A restless 18-month-old girl; body temperature of 39°C from yesterday; touches her left ear during examination; and an equivocal otoscopic examination	9.8%	*90.2%
A 32-year-old woman with a history of upper respiratory tract infection within the last week; complains of dull pain in her right ear; and annular redness around TM on otoscopic examination	13.1%	*86.9%

*: True answers based on AAP/AAFP guidelines

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Table 4. Percentage of physicians who decided to choose "antibiotic therapy" or "observation without antibiotic therapy" in certain and probable AOM conditions for 6 different scenarios.

Scenarios	Certain diagnosis		Probable diagnosis	
	Observation without antibiotic therapy	Antibiotic therapy	Observation without antibiotic therapy	Antibiotic therapy
An infant younger than 6 months with fever less than 39°C	15.5	*84.5	60.3	*39.7
An infant younger than 6 months with fever more than 39°C	6.5	*93.5	13	*87
A 6-month- to 2-year-old child with fever less than 39°C	35.7	*64.3	*91.4	8.6
A 6-month- to 2-year-old child with fever more than 39°C	6.8	*93.2	35.7	*64.3
A child older than 2 years with mild otalgia and fever less than 39°C	*70.7	29.3	*91.1	8.9
A child older than 2 years with mild otalgia and fever more than 39°C	8.1	*91.9	*37	63

*. True answers based on AAP/AAFP guidelines

For treatment of the second case after 48-72h observation without response to initial therapy, only one out of four pediatrician (25.0%) chose an appropriate antibiotic (Co-Amoxiclav 80-90mg/kg/day) while 17.9% chose low dose Co-Amoxiclav (40-50mg/kg/day); 17.9 % chose high dose Amoxicillin (80-90mg/kg/day) and 17.9% chose Ceftriaxone.

For treatment of the first case after 48-72h observation without improvement 38.3% chose an appropriate antibiotic (Amoxicillin 80-90mg/kg/day); 28.3 % chose low dose Amoxicillin (40-50mg/kg/day); 20.0% chose low dose Co-Amoxiclav (40-50mg/kg/day) and 6.7% chose high dose Co-Amoxiclav (80-90mg/kg/day).

For treatment of the second case after 48-72h observation without improvement 30.0% chose an appropriate antibiotic (Co-Amoxiclav 80-90mg/kg/day); 31.7 % chose high dose Amoxicillin (80-90mg/kg/day); 15.0% chose low dose Co-Amoxiclav(40-50mg/kg/day); 6.7% chose low dose Amoxicillin (40-50mg/kg/day).

Only 31.6% chose an appropriate antibiotic (Co-Amoxiclav 80-90mg/kg/day) for the first case after 48-72h antibiotic therapy without response; 19.3% chose low dose Co-Amoxiclav (40-50mg/kg/day); 14.0% chose high dose Amoxicillin (80-90mg/kg/day); 10.5%chose Azithromycin; 10.5% chose observation and 9.0% chose combination therapy.

For treatment the second case after 48-72h antibiotic therapy without response only 17.5% chose an appropriate antibiotic (Ceftriaxone); 33.3% chose high dose Co-Amoxiclav (80-90mg/kg/day); 14.0% chose Azithromycin; 12.3% chose low dose Co-Amoxiclav (40-50mg/kg/day); 10.5% chose high dose Amoxicillin (80-90mg/kg/day) and 10.8% chose combination antibiotic therapy.

Discussion

Although the guidelines are intended to give the opportunity to the patients to receive the same medical care all over the world, it is worth noting that many factors may affect the degree of adherence to the guidelines in different populations. Several studies have been done to compare the real behavior of physicians in the management of patients and the recommended ruled described in the guidelines.

The present study was designed to evaluate Iranian pediatricians` following to the recommended practical guidelines for the management of the patients with acute otitis media.

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Diagnosis of AOM based on the recommended guideline

Our results showed that in all of the provided cases, except third one (Table 2), the majority of pediatricians, whether they have been diagnosed disease by certainty or not, behave as the recommended guidelines for the diagnosis of the AOM in children. This could be due to systematic approach to diagnosis of the disease in textbooks or other educational materials they have used either in their residency period or practice.

Treatment of AOM based on the recommended guideline

The second section of the questionnaire had been designed to evaluate the adherence of pediatricians to the recommended guidelines for treatment of AOM (table 3). In definite diagnoses, our result showed that trend of treatment was totally toward the recommended guidelines, especially in the cases that were diagnosed by certainty. In probable diagnoses, in most of cases which the physician diagnosed the disease as the probable AOM, the trend of following treatment was toward the guidelines (Table 3). This is important especially because treatment guidelines are widely in access for most of physicians and may be due to their use of online and evidence-based materials including practice guidelines.

Results of the third section of the questionnaire show that in most of 6 given scenarios, the administered antibiotic is different from the drug of the choice; recommended by the guideline. Pediatricians' attitudes have been shown toward choosing a lower potency antibiotic compared to the choice treatment in this approach while interpreted in more details. In other words, even in severe cases of AOM, Iranian pediatricians prefer to avoid a broad spectrum antibiotic. This is probably due to the awareness of the physicians to the dissemination of antibiotic resistance microorganisms in the pediatric population. However, this may be a result of the failure in judgment to select an appropriate antibiotic as well. These two possibilities can only be differentiated by comparing the outcomes of the patients in each group. A better prognosis in the group who receives recommended antibiotic shows that the treatment approach should be changed by pediatricians. On the other hand, better prognosis in the group of low potency antibiotics maybe a reason for revising the recommended guidelines based on responsible microorganisms in Iran, leading to prevention of emerging antibiotic resistant microorganisms. However, this study was not able to clarify this issue because it was done based on the hypothetical cases so follow up was impossible. Reported results in other studies and counties are similar to ours. Study of Vernacchio et al. (17) showed a significant difference between the guidelines of AAP/AAFP and the administered antibiotic for the treatment of AOM. In Vernacchio`s study, based on guidelines, the prescribed antibiotics for the four common clinical scenarios include: high dose amoxicilline for mild AOM (57.2%), high dose amoxicillin-clavulanate for severe AOM (12.7%), high dose amoxicillin-clavulanate for the patients unresponsive to the initial amoxicilline therapy (42.8%) and intramuscular ceftriaxone for the patients unresponsive to the high dose amoxicilline-clavulonate (16.7%). The results of the study by Coco et al. (18) showed that prescription of amoxicillin-clavulanate was unexpectedly the treatment of choice for children with severe symptoms (2% of patients with AOM), and could decrease non response rate to therapy. It was regarding the selection of the appropriate antibiotic in the treatment of acute otitis media and regardless of presence of a valid guideline. This study is another instance of disregarding the AOM management guideline by physicians, at least for one of its most important parts. Gatier et al. assessed use of ceftriaxone for the treatment of resistant acute otitis in another study. The goal of their study was to determine the role of recommended guideline regarding the treatment of resistant AOM. Ceftriaxone was administered in 16.7% of cases before the release of guideline and had been reached to 22.4% after its introduction that was not sta-

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tistically significant (p=0.40) (19). The reason of these similarities between different studies from different countries could be a result of non-evidence-based approach to practice at least in this specific field of medicine. It is surprising that most of these studies have been conducted in the recent 6-7 years, while evidence-based approach has been a common way for practice recently. Another probable reason for these similarities could be using similar texts as references for physicians' practice while those are not totally based on valid evidences.

After all, this study was conducted to evaluate the knowledge and attitude rather than the practice of pediatricians, so it could not be a picture of their practice. The practice could be a result of knowledge, attitude and many other factors such as environmental variables, epidemiology of disease and even patient's pressure. This could be a good reason to develop national and even local practice guidelines for a standard practice and next studies could be in dimension of assessment of physicians' practice in a real or simulated environment and developing standard and practical guidelines.

Limitations

First, surveyed physicians based in Tehran about their knowledges and attitudes regarding AOM management and this may be different in other parts of country. Second, we tried our best to increase the response rate from the physicians; the non-responders could be a potential source of bias in our results and are the subject of future research to be included in a more comprehensive study on guideline adherence.

Conclusion

This study seems to add new insights to the previous literature on management of AOM according to guideline. We can assess the impact of guidelines on the usual practice of pediatricians in evidenced-based management of AOM. Two results from the study highlight this specific point: first, the majority of physicians believed that they have been educated acceptably to manage AOM during their attendances in medical school; and second, physicians who graduated recently, had much adherence to guidelines compared to those with much history of practice.

On the other hand, exploring the reasons for non-compliance to the guidelines from the part of more expert physicians will be the objectives of future research in this area. It seems that recent studies are somehow inconclusive to answer these kinds of questions. Does it result from the notion that traditional approaches are easier to be followed by older physicians or does it show the foible aspects of guidelines which inhibit clinicians to apply them in their real practice?

References

1. Paradise JL. Otitis media in infants and children. *Pediatrics.* 1980;65(5):917-943.

2. Puhakka H, Hagman E, Heikkinen T et al. Evidence-based guidelines for treatment of acute otitis media in children. Duodecim 1999; 115: 2155–61. Updated 2004 June http://www.kaypahoito.fi (accessed on 24 June 2009), (in Finnish).

3. Rautakorpi UM, Klaukka T, Honkanen P et al. Antibiotic use by indication: a basis for active antibiotic policy in the community. Scand J Infect Dis 2001; 33: 920–6.

4. Finkelstein JA, Metlay JP, Davis RL et al. Antimicrobial use in defined populations of infants and young children. Arch Pediatr Adolesc Med 2000; 154: 395–400.

5. Boruk M, Lee P, Faynzilbert Y, Rosenfeld RM: Caregiver well-being and child quality of life. Otolaryngology - Head and Neck Surgery 2007, 146:159-168.

6. Thompson PL, Spyridis N, Sharland M et al. Changes in clinical indications for community antibiotic prescribing for children in the UK from 1996–2006: will the new NICE prescribing guidance on upper respiratory tract infections be ignored? Unpublished data.

7. Goosens H, Ferech M, Stichele R Vander, Elseviers M, for the ESAC Project Group: Outpatient antibiotic use in Europe and association with resistance: a cross-national database study. *Lancet* 2005, 365:579-587.

8. Spellberg B, Guidos R, Gilbert D, Bradley J, Boucher HW, Scheld WM, Bartlett JG, Edwards J Jr: The epidemic of antibiotic-resistant infections: a call to action for the medical community from the Infectious Diseases Society of America. *Clin Infect Dis* 2008, 46:155-164.

9. Klugman KP: Pneumococcal resistance to anti-

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biotics. *Clin Microbiol Rev* 1990, 3:171-196.

10. Glasziou PP, Del Mar CB, Sanders SL et al. Antibiotics for acute otitis media in children (Cochrane Review). Cochrane Database of Systematic Reviews, 1997, Issue 1. Art. No.: CD000219. DOI: 10.1002/14651858.CD000219.pub2.

11. House of Lords Select Committee on Science and Technology. Resistance to antibiotics and other antimicrobial agents, 7th report 1997–1998, The Stationery Office, London, 1998.

12. Standing Medical Advisory Committee. The Path of Least Resistance. London: Department of Health, 1998. www.advisorybodies.doh. gov.uk/ smac/smac1.htm (accessed 14 July 2008).

13. SIGN (Scottish Intercollegiate Guidelines Network). Diagnosis and management of childhood otitis media in primary care. A national clinical guideline, 2003. www.sign.ac.uk/guidelines/ fulltext/66/ index.html (Accessed 14 July 2008).

14. Prodigy. Otitis media—acute, 2004. www. prodigy.nhs.uk/otitis_ media_acute (accessed 14 July 2008).

15. Rovers MM, Glasziou P, Appelman CL et al. Antibiotics for acute otitis media: a meta-analysis with individual patient data. Lancet 2006;368:1429–35.

16. American Academy of Pediatrics, Subcommittee on Management of Acute Otitis Media. Diagnosis and management of acute otitis media. *Pediatrics.* 2004;113(5): 1451–1465.

17. Hopkins, R.H., Acute otitis media diagnosis and management: guideline overview. J Ark Med Soc, 2004. 101(6): p. 184-5.

18. Cocco et al. Management of Acute Otitis Media by Primary Care Physicians: Trends Since the Release of the 2004 American Academy of Pediatrics/American Academy of Family Physicians Clinical Practice Guideline PEDIATRICS Volume 120, Number 2, August 2007 p. 281

19. Gauthier, M., et al., Ceftriaxone for refractory acute otitis media: impact of a clinical practice guideline. Pediatr Emerg Care, 2009. 25(11): p. 739-43.

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