The Cranial Academy Position on Treatment of Otitis Media

Eric J Dolgin, D.O., F.C.A.

Introduction

The osteopathic approach to treating otitis media (OM) has traditionally utilized osteopathic manipulative treatment (OMT) primarily and appropriate adjunct measures secondarily (pharmacotherapy, nutrition, lifestyle, etc.). This has been based on sound anatomic-physiologic models and clinical experience applying osteopathic insight.

Background

OM is the most common reason for prescribing antibiotics to pediatric patients. The number of office visits has increased out of proportion to the increase in population.

With the increase in prescriptions, a great deal of controversy has surfaced surrounding prudent treatment of this problem. Recently, concern about overprescribing antibiotics has been a lively topic for discussion especially with little change in outcome for all forms of OM from most prescribing habits.

In addition, there is great concern about antibiotic resistant strains of common pathogens and the contribution to this problem from frequent prescribing.[1]

Types of OM

OM has been classified into several general types, acute otitis media (AOM) and otitis media with effusion (OME) being the most common:

AOM is defined as the presence of fluid in the middle ear in association with signs or symptoms of acute local or systemic illness. Accompanying signs and symptoms may be specific for AOM, such as otalgia or otorrhea; or nonspecific, such as fever.[2]

It is one of the most prevalent diseases in early childhood and the most common infection for which antibiotics are prescribed in the US, accounting for more than 13 million prescriptions in the year 2000.[3]

50% of children have at least one episode of AOM by age 7,[4] and 50% of all cases of AOM end up developing middle ear effusion (MEE).[5]

OME is defined as the presence of fluid in the middle ear in the absence of signs or symptoms of acute infection.

OME occurs in about 90% of children before school age, most often between 6 months and 4 years old (with pathology present in 80% of the individuals' ears).[6] It has a prevalence of up to 30%, and a cumulative incidence of 80% at the age of four years.[7]

By 1 year old more than 50% of children will experience OME; by age 2 years this will increase to more than 60%. Most episodes resolve spontaneously by 3 months, however 30%-40% of children have recurrent OME with 5%-10% of these episodes lasting 1 year or longer.[8]

OME may occur spontaneously because of poor Eustachian tube function or as an inflammatory response following AOM.[8]

Some children may go on to develop chronic OM, language delays and behavioral problems.[7]

Osteopathic Causation

Osteopathy in the Cranial Field (OCF) has posited that healthy function of the human ear is dependent on the inherent physiologic mobility of the temporal bones within the cranial mechanism and the relationship to all other anatomic structures to which they are connected, directly or indirectly.

Pharmacotherapy

AOM

AOM accounts for 60% of the antibiotics written for children.[1]

Studies have demonstrated that when treating non-severe AOM with antibiotics there is small or *no* benefit when compared to doing nothing.[1 9 10 11]

In addition, there was no difference in:

- Parent satisfaction
- Days of work or school missed
- Visits to doctors' offices or emergency rooms
- Number of phone calls
- Recurrence rate by day 30
- Clinical examination of the children's eardrums at day 30.[1 12]

Regarding antibiotic treatment for AOM, meta-analyses report that 15 to 17 children need to be treated (NNT=17) in order to eliminate otalgia in 1 child, 2 to 7 days after initial presentation to the physician.[3]

Another study reported 1 in 7 patients would suffer some side effect from antibiotic treatment.[13]

OME

Prescribing antibiotics for OME is *not* effective treatment

according to numerous studies and reviews. [8] [12] [14] [15]

Prophylactic treatment with antibiotics has been used for this problem in the past, however there is no evidence to support its effectiveness.[16] [17] [18]

There is also insufficient evidence to support the use of decongestants, antihistamines or corticosteroids in OME.[19] [20] [21]

Surgical treatment

Several types of surgical procedures have been implemented to treat and prevent different forms of OM.

Adenoidectomy, as the first surgical treatment of children aged 10 to 24 months with recurrent acute otitis media, is not effective in preventing further episodes.[8] [22] [23] [24] It cannot be recommended as the primary method of prophylaxis.

Prompt insertion of tympanostomy tubes with persistent middle ear effusion did *not* improve developmental outcomes in children up to 9 to 11 years of age.[25] Though there may be possible short term improvement in symptoms, tympanostomy tubes have not been shown to make a difference in hearing in long term use.[20] Tympanostomy tubes significantly increase the cost of treatment and studies indicate that they are overused.[18] [26] [27]

Complications from OM

Proponents of antimicrobial therapy often state that complications such as mastoiditis, loss in language development, and reinfection, are significantly reduced with early prescribing, however studies have not demonstrated this to be true.

The incidence of mastoiditis is not significantly different between children who do and do not receive antibiotic treatment for AOM.[1,28,29,30]

Hearing loss from OME is not the major factor with concomitant loss in language development and skills.[31] It has been shown that parenting is a much greater factor than anything else. [20]

Administering antibiotics does not reduce recurrence of OM.[1]

Complications from tympanostomy tubes include perforation, scarring, infection, and early or delayed expulsion of tubes.[18]

Watchful Waiting

In the Netherlands, Sweden, and the state of New York, watchful waiting (WW) is an official policy. In many other areas it is recommended that parents of children diagnosed with AOM be taught to wait 48-72 hours before seeking treatment or prescribing antibiotics.[32]

WW both with and without a prescription were often well accepted and reduced antibiotic use without compromising parental satisfaction. [1] [33,34] [35]

Osteopathic Treatment

OM has traditionally been successfully treated using osteopathic methodology since the beginning of the profession.

It involves the use of specifically administered gentle perceptive OMT to restore uninhibited symmetrical physiologic inherent motion. In addition, it will improve venous and lymphatic drainage, enhance arterial blood supply and stimulate the body's own inherent healing process.[36]

This methodology has proven extremely safe for young children, especially for prevention. There are no adverse effects that have been reported in the literature for young children after approximately 70 years of application of Osteopathy in the Cranial Field. In fact, parents often report a general increase in health and well-being of their children.

Clinical experience (with documented cases) has demonstrated that OMT can effectively treat both AOM and OME.

Pilot studies have documented that there is therapeutic benefit implementing osteopathic treatment in cases of otitis media.[33] [37] In addition, there are sound anatomic-physiologic models explaining the effectiveness of osteopathy in the cranial field.[38] [35,39,40] [41] [42] [43]

Preventive Measures

The following have been shown to be effective in decreasing the incidence of OM:

- Eliminating food allergens[44] [45]
- Reducing or eliminating pacifier use[46]
- Nursing for at least the first 11 months of life[47]

Though there are no published studies yet on the effectiveness of OMT in preventing OM, the previously mentioned anatomic-physiologic mechanisms allow OMT to be used for prevention as well as for treatment of otitis media.

Conclusion

As:

> Antimicrobial therapy has been shown to provide little benefit in the treatment of AOM and OME…
>
> And as tympanostomy tubes, use of decongestants, antihistamines, or corticosteroids have demonstrated very limited benefit in the treatment of AOM and OME…
>
> And as there is little to no difference in clinical outcome between WW for 72 hours and prescribing antibiotics for AOM…
>
> And as OMT has proven to be clinically beneficial for treating otitis media and is the osteopathic approach…

It is the position of the Cranial Academy that:

Osteopathic treatment utilizing the principles of OCF should be the initial treatment in most forms of otitis media and included in the treatment of all forms of otitis media.

Patient education along with safe and proven preventive measures should be implemented whenever possible.

Antimicrobial treatment should be used in AOM only as an adjunct measure in patients who fail to respond adequately to osteopathic treatment after 72 hours, are high risk, or at the discretion of the physician with regard to clinical circumstances.

Tympanostomy tubes, decongestants, antihistamines, and corticosteroids should be used only under compelling clinical circumstances.

Children should be screened in the nursery for somatic dysfunction of the head that can contribute to or cause future cases of OM.

References

* Number needed to treat or NNT is an epidemiological term that indicates the number of patients that need to be treated in order to prevent one additional bad outcome.

1. McCormick DP et al., *Nonsevere Acute Otitis Media: A Clinical Trial Comparing Outcomes of Watchful Waiting Versus Immediate Antibiotic Treatment*. Pediatrics: June 2005; 115; No. 6; 1455.

2. Dowell SF et al., *Otitis Media—Principles of Judicious Use of Antimicrobial Agents*. Pediatrics: Supplement January 1998; 101; No. 1; 166.

3. Spiro DM et al., *Wait-and-See Prescription for the Treatment of Acute Otitis Media*. JAMA: 2006; 296: 1235-1241.

4.. Kozyrskyj A et al., *Short course antibiotics for acute otitis media*. Cochrane Database of Systematic Reviews: 2000; 2; Art. No. CD001095.

5. Alho H. Oja et al., *Risk factors for chronic otitis media with effusion in infancy*. Arch Otolaryngol Head Neck Surg: 1995; 121; 8; 839-843.

6. Tos M, *Epidemiology and natural history of secretory otitis*. Am J Otol: 1984; 5; 459-462.

7. Parrella A et. al., *EarPopper™ for the treatment of Otitis media in children*. ANZHSN, Horizon scanning prioritising summary Update Number 4, HealthPACT Secretariat, Department of Health and Ageing: February 2007.

8. Subcommittee on Otitis Media With Effusion, American Academy of Family Physicians, American Academy of Otolaryngology-Head and Neck Surgery and American Academy of Pediatrics, *Otitis Media With Effusion- Clinical Practice Guidelines*. Pediatrics: 2004; 113; 1412-1429.

9. Sanders S et al., *Antibiotics for acute otitis media in children*. The Cochrane Database of Systematic Reviews, 2004; 1; Art. No. CD000219. DOI: 10.1002/14651858.CD000219.pub2.

10. Little P et al., *Pragmatic randomised controlled trial of two prescribing strategies for childhood acute otitis media*. BMJ: 2001; 322; 336-342.

11 Agency for Healthcare Research and Quality (AHRQ), *Management of Acute Otitis Media Summary Evidence Report* .Technology Assessment: Number 15.

12. Cantekin EI, McGuire TW, *Antibiotics Are Not Effective for Otitis media with Effusion: Reanalysis of Meta-Analyses.* Otorhinolaryngol Nova: 1998;.8; 214-222.

13. Rosenfeld RM et al., *Clinical efficacy of antimicrobial drugs for acute otitis media: metaanalysis of 5400 children from thirty-three randomized trials*. Journal of Pediatrics: 1994 124; 355-67.

14. Dowell SF et al. *Otitis Media— Principles of Judicious Use of Antimicrobial Agents*. Pediatrics 1998 Supplement: No 1; 101; 165-171.

15. Williamson I. *Otitis Media with Effusion.* BMJ Clin Evid: 2008; 01; 502; 3-4.

16. Koopman L et al. *Antibiotic Therapy to Prevent the Development of Asymptomatic Middle Ear Effusion in Children With Acute Otitis Media*. Arch Otolaryngol Head Neck Surg: 2008; 134(2); 128-132.

17. Damoiseaux RA. *Antibiotic treatment of acute otitis media in children under two years of age: evidence based?* Br J Gen Pract: 01-DEC-1998; 48(437); 1861-4.

18. Rasgon BM et al., *Tympanostomy tubes for otitis media: quality-of-life improvement for children and parents*. Ear, Nose & Throat Journal; July 2005; 84(7); 418, 420-22, 424.

19. Cantekin EI et al. *Lack of efficacy of a decongestant-antihistamine combination for otitis media with effusion ("secretory" otitis media) in children. Results of a double-blind, randomized trial*. N Engl J Med: 1983; 308; 297-301.

20. Roberts J, et al., *Otitis media, hearing loss, and language learning: controversies and current research*. J Dev Behav Pediatr: Apr 2004; 25(2); 110-22.

21. Coleman C, Moore M. *Decongestants and antihistamines for acute otitis media in children*. Cochrane Database Syst Rev: 16 Jul 2008; (3); CD001727.

22. Rosenfeld RM, Bluestone CD. *Evidence-based otitis media*. Hamilton(UK): B.C. Decker Inc; 2003.

23. Mattila PS et al. *Prevention of otitis media by adenoidectomy in children younger than 2 years*. Arch Otolaryngol Head Neck Surg 2003;129(2): 163–8.

24. Hammaren-Malmi S et al. *Adenoidectomy does not significantly reduce the incidence of otitis media in conjunction with the insertion of tympanostomy tubes in children who are younger than 4 years: a randomized trial*. Pediatrics 2005; 116(1): 185–9.

25. Paradise JL, Feldman HM et. al. *Tympanostomy tubes and developmental outcomes at 9 to 11 years of age*. N Engl J Med: 18 Jan 2007; 356(3); 248-61.

26 Kleinman LC et al., *Evidence of Disproportionate Increase in the Use of Tympanostomy Tubes in US Children: 1996 to 2006*, Pediatric Academic Societies (PAS) 2009 Annual Meeting: Abstract 4525.7. Presented May 4, 2009.

27. Roberts J et al., *Otitis media may not substantially increase risk of delayed speech development in typically developing children*. Developmental and Behavioral Pediatrics: 2004; 25 (2); 110-122.

28. Ho D et al.,. *The Relationship Between Acute Mastoiditis and Antibiotic Use for Acute Otitis Media in Children*. Arch Otolaryngol Head Neck Surg: 2008; 134(1); 45-48.

29. Thompson PL, et al., *Effect of Antibiotics for Otitis Media on Mastoiditis in Children: A Retrospective Cohort Study Using the United Kingdom General Practice Research Database*. Pediatrics: 2009; 123; 424-430.

30. Browning GG, *Mastoiditis and quinsy are too rare to support antibiotic prophylaxis*. Clin Otolaryngol: 01-JUN-2008; 33 (3); 253-4.

31. Serbetcioglu B, *No association between hearing loss due to bilateral otitis media with effusion and Denver-II test results in preschool children*. Int J Pediatr Otorhinolaryngol: 01-FEB-2008; 72(2); 215-22.

32. Rosenfeld RM. *Observation Option Toolkit for Acute Otitis Media*. Int. J. Pediatr. Otorhinolaryngol: 2001; 58; 1-8.

33. Chao JH et al., *Comparison of Two Approaches to Observation Therapy for Acute Otitis Media in the Emergency Department*. Pediatrics: 2008; 121; e1352-e1356.

34. Siegel RM et al., *Treatment of otitis media with observation and a safety-net antibiotic prescription*. Pediatrics: 2003; 112 (3 pt 1); 527-531.

35. Armengol CE et al. *The Natural History of Acute Otitis Media by AAP Criteria during Colds in Young Children*. Pediatric Academic Societies (PAS): 2009 Annual Meeting: Abstract 4315.4. Presented May 4, 2009.

36. Mills MV et. al., *The Use of Osteopathic Manipulative Treatment as Adjuvant Therapy in Children With Recurrent Acute Otitis Media*. Archives of Pediatric and Adolescent Medicine: Sep 2003; 157; 861-66.

37. Mills MV, *The Use of Hands-on Treatment in the Treatment of Recurrent Otitis Media* [dissertation]. Tulsa: Oklahoma State University College of Osteopathic Medicine.

38. Magoun HI, *Osteopathy in the Cranial Field*. 3rd ed. Kirksville, Mo: Journal Printing Co; 1976; pp. 98, 285-6.

39. Shaw HH, Shaw MB, *Osteopathic considerations in the clinical specialties: ear, nose, and throat*. In: Ward RC, exec ed. Foundations for Osteopathic Medicine. Baltimore, Md: Williams & Wilkins; 1997; 289-297.

40. Pulec JL, *Eustachian Tube Lymphatics*. Ann Otol Rhinol Laryngol: Jul-Aug 1975; 84(4 Pt 1); 483-92.

41. Degenhardt BF et al. *Osteopathic Evaluation and Manipulative Treatment in Reducing the Morbidity of Otitis Media: A Pilot Study*. JAOA: 2006; Vol 106; No 6; June; 327-334.

42. King HH, *The Collected Papers of Viola M. Frymann, DO*. American Academy of Osteopathy, Indianapolis, IN.. 1998; p. 110.

43. Bluestone CD. *Impact of evolution on the eustachian tube*. Laryngoscope: 2008 Mar; 118(3); 522-7.

44. François M, *Otite séreuse et allergie*. Archives de pédiatrie: 2009; 16; 84–87.

45. Lasisi AO, *Early onset otitis media: risk factors and effects on the outcome of chronic suppurative otitis media*. Eur Arch Otorhinolaryngol: 01-JUL 2008; 265(7): 765-8.

46. Rovers MM, *Is pacifier use a risk factor for acute otitis media? A dynamic cohort study*, Fam Pract: 01-AUG- 2008; 25(4): 233-6.

47.Vogazianos E, *The effect of breastfeeding and its duration on acute otitis media in children in Brno, Czech Republic*. Cent Eur J Public Health: 01-DEC-2007; 15(4): 143-6.

45. Koivunen P et al. *Adenoidectomy versus chemoprophylaxis and placebo for recurrent acute otitis media in children aged under 2 years: randomised controlled trial*. BMJ: 28 Feb 2004; 328(7438); 487.

46. Lous J et al. *Grommets (ventilation tubes) for hearing loss associated with otitis media with effusion in children*. Cochrane Database Syst Rev: 25 Jan 2005; (1):CD001801.

47. Roark et al. *Continuous twice daily or once daily amoxicillin prophylaxis compared with placebo for children with recurrent acute otitis media*. The Pediatric Infectious Disease Journal: April 1997; Volume 16; Issue 4; 376-381.

48. Moresi AC, *Otitis Media: An Osteopathic Approach*, The Cranial letter: 1995; Vol. 8; Issue 4.

49. Riding KH et al. Microbiology of recurrent and chronic otitis media with effusion. J Pediatr: Nov 1978; 93(5); 739-43.

50. Coco AS. *Cost-Effectiveness Analysis of Treatment Options for Acute Otitis Media*. Annals of Family Medicine: 2007; 5; 29-38.

51. Williamson IG et al. *The natural history of otitis media with effusion--a three-year study of the incidence and prevalence of abnormal tympanograms in four South West Hampshire infant and first schools*. J Laryngol Otol: Nov 1994;108(11); 930-4.