Why are We Still Talking about Paediatric Otorrhoea?

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Dear Editor,

A 3-year-old child presents to their family doctor with a 3-week history of unilateral otorrhoea. The reality of what happens next is unclear. The majority of children with otorrhoea are managed by their family doctor rather than the specialist otolaryngologist. Family doctors tend to favour systemic antibiotics while otolaryngologists favour topical antibiotics.

Otorrhoea in the paediatric population is most frequently a sequela of an infective process involving the middle ear cleft and is associated with perforation of the tympanic membrane. If the otorrhoea is temporary, it is defined as Acute Otitis Media (AOM) and the term Chronic Suppurative Otitis Media (CSOM) is applied to persistent otorrhoea. The timeframe defining CSOM varies in the published literature, the World Health Organisation (WHO) describes CSOM as otorrhoea for over 2 weeks [1], whilst others use a 3 month cut off [2]. The microbiology of CSOM is diverse with pseudomonas aeruginosa being the predominant microorganism [3].

So why is CSOM important?

The incidence of CSOM is 4.76 per thousand worldwide (31 million cases in total), predominantly occurring in developing nations. Of these 7 million occur in children under the age of 5 years [4]. The WHO suggests that CSOM may cause over half of the significant hearing disability worldwide [1], leading to developmental delay and a negative impact on educational attainment [5]. The mortality related to CSOM in 1990 has been estimated to be 28,000 people worldwide [1].

Hearing loss is most commonly conductive and may improve following repair of the tympanic membrane perforation (tympanoplasty/myringoplasty). A recent systematic review has demonstrated closure of the air bone gap to <20dB in 70.7% of cases. The same review found a post-operative complication rate of 14% following tympanoplasty for CSOM (persisting tympanic membrane perforation 52.1%, postoperative infection or otorrhoea 10.0%) [6]. Furthermore, whilst recognised as a potential complication of CSOM, the incidence of permeant sensorineural hearing loss is unknown [7,8]. Complications occur in 2.6% of patients with CSOM (mastoid abscess 28.3%, labyrinthitis 9.0%, facial nerve palsy 8.4%, Bezold’s abscess 1.3%, lateral sinus thrombosis 19.5%, perisigmoid sinus abscess 13.5%, meningitis 9%, brain abscess 6.5%, extradural abscess 4.5%) [9].

Who is at risk of developing CSOM?

The risk factors for developing CSOM in children are multifactorial and might be assumed to be similar to those for AOM [1]. Known factors include low socioeconomic class, parents with low educational level, maternal history of CSOM, older siblings, recurrent upper respiratory tract infections (3 episodes within 6 months) and previous tympanostomy tube insertion [10-12].

So how do we manage CSOM and what is the evidence base?

Broadly the options for management include topical or systemic antibiotics, topical antiseptics and aural toilet. Compared to antibiotics, antiseptics are chemicals which slow the growth of or destroy microorganisms and are applied topically. Cochrane released a special collection of 7 systematic reviews in April 2021 comparing the non-surgical management options for CSOM (https://www.cochranelibrary.com/collections/doi/SC000049/ full).

The quality of evidence included in the 7 systematic reviews was generally low or very low. An exception was the comparison between quinolone topical antibiotics and boric acid for otorrhoea resolution which demonstrated moderate evidence (GRADE) [13]. The authors could not make conclusions regarding the most efficacious management of CSOM. Current randomised controlled trials fail to identify treatment outcomes such as...

Cite this article: Heward E, Molloy J, Nichani JR, Bruce IA (2021) Why are We Still Talking about Paediatric Otorrhoea? Ann Otolaryngol Rhinol 8(3): 1269.
otorrhoea resolution after 2 weeks post treatment, impact on health-related quality of life and hearing.

In terms of topical antibiotics, the systematic reviews suggested that topical quinolone antibiotics may be more effective at reducing otorrhoea at 1-2 weeks post treatment verses placebo or oral quinolone or amoxicillin-clavulan acid [14,15]. Furthermore, topical quinolones seemed to outperform aminoglycoside topical drops in reducing otorrhoea at 1-2 weeks [15]. It is unclear whether the addition of steroids to topical antibiotics improves otorrhoea or otalgia when compared to topical antibiotics alone [16]. Similar inconclusive findings were also reported for the addition of systemic antibiotics combined with topical treatment [14]. Systemic intravenous antibiotics (mezlocillin or ceftazidime) alone may improve otorrhoea, compared to placebo, at 1-2 weeks post treatment [14]. Antibiotics were selected which are active against pseudomonas aeruginosa, the most commonly isolated microorganism in CSOM.

There are many antiseptics (acetic acid, aluminium acetate, boric acid and povidone-iodine) which can be applied topically to the ear. The daily use of topical antiseptics (boric acid in alcohol ear drops with daily dry mopping) for 1 month seemed to reduce otorrhoea 3-4 months post treatment compared with dry mopping alone for 1 month [17]. When compared with topical antibiotics (quinolone), boric acid is less effective in reducing otorrhoea at 1-2 weeks post treatment [18]. It is unclear how acetic acid or povidone-iodine compare to topical antibiotics [18].

The evidence relating to aural toilet (dry mopping twice daily for 4 weeks) for CSOM was unclear as to whether it improved otorrhoea at 16 weeks compared to no treatment [19]. Surprisingly, none of the American, British or European otolaryngology societies have management guidelines for CSOM, likely reflecting the paucity in evidence.

To be able to manage children with otorrhoea effectively and perform meaningful research we must be able to diagnose and classify these patients appropriately. The nomenclature for classifying paediatric otorrhoea is currently complex and the chronicity separating acute and chronic otitis media is not standardised. Differentiation based purely on chronicity is likely to contribute to the current treatment uncertainty and our focus should change to the more clinically meaningful (‘real-world’) problem of ear infection with or without otorrhoea. Many factors likely influence whether otorrhoea becomes persistent including microbiology, immunology, genomics, environment and anatomy. Changing the nomenclature in clinical research and practice would ameliorate the current heterogeneity in terminology and facilitate the development of a concise evidence-based approach to management.

So what is the most important prognostic and therapeutic information when presented with a child with otorrhoea?

We need to know ‘who’ to treat, ‘when’ to treat and ‘how’ to treat, and the acceptability, timing and efficacy of non-surgical (topical and systemic antibiotics, and antiseptics) and surgical interventions. A future evidence-based management algorithm is likely to comprise both surgical and non-surgical treatments, with more work needed to determine their respective roles.

REFERENCES

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