Ear Disease in Children

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The CARPA STM treatment protocols for ear disease are heavily based on a recent systematic review of existing evidence on the management of otitis media and a subsequent document on Recommendations for Clinical Care Guidelines on the Management of Otitis Media.[1,2] The second of these documents provides a brief summary of evidence on all issues covered in the treatment protocols and should be utilised as the primary resource document for health care workers in the field. The documents are available from the Office for Aboriginal and Torres Strait Islander Health, Commonwealth Department of Health and Ageing. A further useful document is the General Guidelines for Audiological Practice with Indigenous Australians prepared by a special interest group of the Audiological Society of Australia.[3]

Definitions

The CARPA STM utilises the definitions used in the Recommendations for Clinical Care Guidelines.[2] These are:

Otitis media: Refers to all forms of inflammation and infection of the middle ear.

Otitis media with effusion (OME): Presence of fluid behind the eardrum without any symptoms or signs of acute otitis media.

Acute otitis media (AOM): Presence of fluid behind the eardrum (plus at least one of the following: bulging eardrum, recent discharge of pus, and ear pain) are the most reliable indicators of AOM.

Recurrent acute otitis media: The occurrence of three or more episodes of acute otitis media in a six-month period.

Acute otitis media with perforation (AOM with perforation): Discharge of pus through a perforation (hole) in the eardrum within the last six weeks.

Chronic suppurative otitis media (CSOM): Persistent discharge of pus through a perforation in the eardrum for at least six weeks despite appropriate treatment for AOM with perforation.

Dry perforation: Presence of a perforation in the eardrum without any signs of discharge or fluid behind the eardrum.

Otitis externa (also known as ‘tropical ear’ or ‘swimmer’s ear’): Infection of the ear canal associated with pain, swelling and discharge. This is not a form of otitis media.

Natural history

In remote communities it is clear that the onset of ear disease generally occurs in the first few weeks to few months of life. By 12 months of age

the vast majority of these children have ear disease of one form or another. Persistent or recurrent disease is common.

Diagnosis

The age category with the highest prevalence of ear disease is very young children. Examining the ears in very young children is difficult and often requires considerable expertise. In addition, the diagnosis of middle ear disease with an intact ear drum is dependent on both quite expert otoscopy as well as appropriate hearing tests. All these factors mean that accessing specialist services is an important part of a primary care approach to ear disease in rural and remote communities. In particular, this means an audiologist, but also means finding ways for the population you service to access a specialist ENT consultative service.

Encouraging facial hygiene

There are no specific intervention studies that demonstrate that hygiene practices improve rates of ear disease or lead to improvement in existing ear disease. The technique of ‘blowing, breathing and coughing’ is used in a number of remote schools. It has not been established to impact on ear disease but this, together with frequent face and hand washing, clearly has implications for a range of infectious diseases in children and so it is quite reasonable to support these activities, even in the absence of a clear evidence based impact on ear disease.

Cleaning the external ear canal

Both tissue wicks and syringing are used to clean ears. There are no definitive data to say which is the preferred technique. The tissue wick technique takes time and may need several wicks or ‘spears’ before the canal is clean. The ear canal should be visualised to ensure the canal has been cleaned. Syringing should be done gently with warm water. There are no studies that compare water, saline or dilute Betadine solutions. There is no evidence that Betadine is harmful, and some experts prefer its use to any other solution for syringing. Therefore, it is quite reasonable for staff to use dilute Betadine if available.

Limits to the effectiveness of medical treatment

Although the protocols do outline a treatment approach for most ear conditions the evidence for some of these is not particularly strong, and even where it does exist the ‘effect size’ is not large. A good example of this is the evidence for ear toilet and topical antibiotic drops in the treatment of chronic suppurative otitis media. Although the recommendations are based on the result of a meta analysis of trials, essentially these recommendations depend heavily on one single trial performed in Kenyan school children. In this study the treatment resulted in about 50% of children with an ear which was dry (i.e. no longer discharging) as well as about 15% of children in whom the perforation had healed. However, even these limited benefits occurred only after 16 weeks of therapy. Therapy for one or two weeks resulted in a much smaller number of dry ears. Obviously, in most service settings it would be impossible to deliver therapy continuously for 16 weeks and so the likely impact of these protocols will be less than it was in the study setting.[5]

There is some evidence that quinolone topical eardrops will be more effective than other antibiotics in the treatment of ear disease, but a definitive position on this issue awaits trials that are currently

underway. There is however good evidence that intravenous or intramuscular Ceftazidime given twice daily is effective in the treatment of chronic suppurative otitis media. In the studies performed this has required hospitalisation for a period of 2–3 weeks. Obviously, this will be an option that is extraordinarily difficult for most remote area Aboriginal children, but it does need to be remembered as a possible therapy in particular children.

[Editor: A recently published multicentre RCT compared the effectiveness of topical ciprofloxacin (0.3%; CIP) with the usual framycetin (0.5%), gramicidin, dexamethasone (FGD) eardrops (5 drops twice daily for nine days) as treatments for chronic suppurative otitis media (CSOM) in Aboriginal children. Both groups also received povidone-iodine (0.5%) ear cleaning. Of those 75% followed up (n=111), the ciproflaxicin group had significantly higher rates of dry ear at 10–21 days (absolute difference 24.6%) but no change in perforation size or hearing was shown.

At this stage ciprofloxacin is not licensed for suppurative otitis media but this may change.

(Couzos S, Lea T, Mueller R, Murray R, Culbong M. Effectiveness of ototopical antibiotics for chronic suppurative otitis media in Aboriginal children: a community-based multicentre, double-blind randomised controlled trial. MJA 2003; 179(4):185–190)]

Hearing and audiological interventions

A child with bilateral OME will usually have a hearing loss of around 25 decibels, but it may be more than 40 decibels (a hearing loss of 25 decibels means that normal talking will be very soft. This may disadvantage the child in speech, language development and learning).[2]

CSOM causes the greatest level of conductive hearing loss in high-risk populations. It is usually associated with a hearing loss of around 35 decibels, but may progress to erode the whole eardrum and cause hearing loss of around 60 decibels.[2] People communicating with a hearing-impaired person should be advised to speak slowly (and clearly) after gaining their attention in well-lit conditions. Seating at the front of the class, increased use of visual prompts and interventions that reduce background noise are appropriate (e.g. carpets, quiet heating and air-conditioning systems). Hearing aids are strongly recommended for children with persistent bilateral hearing loss greater than 35 decibels. Ongoing audiological and educational support is essential.[2]

Removing hard wax

Olive oil has been recommended by many sources, including the Australian medicines handbook. A study comparing the in-vitro effect of olive oil, sodium bicarbonate solution (as in the protocol) and Cerumol found that olive oil had no effect on a lump of hard ear wax, Cerumol had dispersed half the wax at 30 hours and the sodium bicarbonate solution had dispersed the wax in one hour.[7] Given that it is about 1000 times cheaper than the commercial product, it is recommended. A dropper bottle with a quarter teaspoon sodium bicarbonate in 10 ml water will be sufficient for many treatments.

[Editor: Discussion of the use of amoxycillin twice a day rather than three times a day for middle ear infection is included in the chapter on antibiotic doses.

The author, Paul Torzillo, was the chair of the technical advisory group for the development of the National Guidelines prepared by the Menzies

School of Health Research ear team. Consequently, they have had a lot of direct and indirect expert review. The ‘big issue’ was that optimal care involves a huge amount of referral and specialist care and assessment, which is not available. The protocols in the fourth edition of the CARPA STM are a compromise to make it more ‘doable.’

There was some discussion during the revision of the ear protocols as to the importance of cleaning out ears blocked with wax or pus. It makes sense that an open ear canal will improve hearing, and this is likely to be a very good thing to encourage in all children with runny ears. However, Torzillo and Boswell looked at the change in hearing in 22 children before and after cleaning out the canal and found no difference. This is contrary to the everyday experience of the audiologist at CAAC clinic in Alice Springs (Kathy Bethune, pers. comm.) where she sees significant improvements in hearing thresholds after cleaning. The difference may be the extent to which the middle ear structures have been destroyed by chronic infection. If there are no middle ear structures then an open ear canal may make less difference. Further, the pus itself is probably ototoxic and erodes the middle ear structures.

It is unlikely that clinic staff will have the capacity to clean these children’s ears daily or more often. Families should be encouraged to do it whenever possible, and in some instances schools may be involved.]

References

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