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Acute otitis externa

Management by GPs in North Queensland

Background

Acute otitis externa (AOE) is a common condition in North Queensland. Clinical guidelines exist for the management of this condition. This study explores the pattern of causative pathogens and management of AOE by general practitioners in North Queensland.

Methods

Eight general practices in three regional cities of North Queensland participated in the study. The three components were: a retrospective case audit of AOE management, a survey of GPs' self reported usual management, and collection of clinical data and microbiological specimens from new cases.

Results

Pseudomonas aeruginosa was the most common causative pathogen in all regions, GPs correctly identified the most common pathogens, there was variation in the use of oral antibiotics between regions (15.8–36.6%), ear syringing is commonly used in managing AOE (51.3%), and most patients (68.9%) required only one GP appointment.

Discussion

General practitioners have good knowledge of the causative pathogens for AOE in their region. While clinical guidelines are generally followed, there is some variation in the prescription of oral antibiotics and use of ear syringing in managing this condition.

■ **Acute otitis externa (AOE) is a common ear condition seen in the primary health care setting. Also known as 'swimmer's ear' or 'tropical ear', it is prevalent in hot humid climates such as North Queensland where swimming is a common activity.¹ There is limited research relating to the range of pathogens that cause this condition, or its management in primary care settings in tropical North Queensland.**

Clinical guidelines developed by the American Academy of Otolaryngology – Head and Neck Surgery Foundation² make recommendations relating to the assessment of comorbidities requiring modification of management, use of topical rather than systemic antimicrobials, cost effective and safe choice of medications, patient instructions about correct use of drops, the role of aural toilet and wicks, and review of nonresponding cases.

A systematic review and meta-analysis of 18 randomised controlled trials of topical antimicrobial therapy for AOE found that use of any topical antimicrobial significantly increased cure rate over placebo, but comparative studies between types of antimicrobials showed only minor differences which were often not statistically or clinically significant. Steroid drops alone were found to increase cure rates by 20% compared with steroid plus antibiotic drops.³

Australian guidelines for antibiotic use state that, 'following dry aural toilet, topical corticosteroid and antibiotic combination drops should be instilled for 3–7 days'.⁴ Severe cases may require a wick, with systemic antibiotics reserved for those with fever, spread to the pinna or folliculitis.

Although the Australian guidelines inform the treatment and management of AOE, they are relatively broad and anecdotal evidence suggests that management practices may vary considerably. In addition, anecdotal evidence from North Queensland suggests that the pathogens associated with AOE infections may vary between sites. The Cochrane Library lists a protocol developed to systematically review the management of AOE,⁵ but this has not been completed.

This project aimed to:

- gain an understanding of how North Queensland general practitioners manage this common condition

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- determine the most common causative pathogens, and any variation in pathogens between different sites, and
- find if any underlying risk factors influence management decisions.

Methods

The population demographics of North Queensland include a younger age profile than the rest of Australia and a higher proportion of Aboriginal people and Torres Strait Islanders.⁶

Eight general practices from three large regional cities in North Queensland were recruited into the study, which consisted of three phases: an audit of management of acute otitis externa cases presenting to GPs in the preceding 12 month period; a self reported questionnaire for GPs, assessing usual management practices, and a prospective clinical survey of patients presenting to GPs over the 2007–2008 summer, including microbiological testing.

For phase 1, practice nurses were trained to search their medical record database to find cases and then complete a de-identified audit sheet. We aimed for 60 audits from each region. Practices were given some financial recompense to cover the nurses' time.

For phase 2, GPs at participating practices were asked to provide written consent and complete a questionnaire reporting their usual management practices in relation to AOE.

For phase 3, GPs were asked to identify patients with new presentations of AOE during a variable time period determined by each practice based on convenience and staffing levels. Practice nurses obtained patient consent, collected a microbiological swab, and completed a clinical information sheet that included swab results.

The de-identified audits, questionnaires and clinical reports

Table 1. Variables explored in each phase of the study

Phase 1. Case audit: age, gender, month of presentation, use of swabs, swab results, comorbidities and contributing factors, ear cleaning methods, pharmaceutical treatments prescribed, nonpharmaceutical management, number of visits, referrals made.

Phase 2. GP questionnaire: number of AOE cases seen per year, enquiry about comorbidities and contributing factors, use of swabs, most prevalent pathogens, methods of cleaning, preferred treatments (pharmaceutical and nonpharmaceutical), use of referral.

Phase 3. Clinical reports: including swabs, age, gender, contributing factors and comorbidities, use of swabs, pathogens isolated, ear cleaning, pharmaceutical and nonpharmaceutical treatments prescribed, value of swab result, referral to other providers.

Table 2. Results of phase 1 – case audit

Factor studied	% (n=201)
Demographics	
• Mean age	32.6 years (1–87)
• Male gender	52.2
Risk factors	
• Comorbidity documented	19.5
• Swimming	14.1
• Presenting January – March	47.2
Management	
• Cleaning method	
– syringing	18.1
– suction	2.1
– dry swabbing	1.6
– nil documented	76.7
• Swab collected	23.6
• Ear drops used	95
• Oral antibiotics	30.3
• One GP visit only	68.9
• Referral to ENT	8.2
Pathogens isolated	
• <i>Pseudomonas</i>	45.7
• <i>Candida</i>	10.9
• <i>S. aureus</i>	10.9
• Aspergillosum	2.2
• No growth	26.1

were forwarded to a nominated GP coordinator in each region, who then passed them on to the central coordinator for analysis. Simple frequency analyses and two sided Chi-square tests for statistical significance of specific associations were conducted using SPSS. Variables explored in each phase of the study are listed in *Table 1*.

Ethics approval for the project was granted by the James Cook University Human Ethics Committee (approval number H2517).

Results**Phase 1**

There were 201 clinical cases of AOE audited (*Table 1*), with the three regions providing 93, 70 and 38 cases respectively. The median age was 32.6 years (range 1–87), with 52.2% males. Comorbidities and contributing factors were documented in 18.5% and 25% of cases respectively. Almost half (47.2%) presented in the 3 months January to March 2008.

Less than 25% (23.6%) of audit cases had a swab taken. The most common pathogen isolated in all regions was *Pseudomonas aeruginosa* (45.7%). There was some regional variation in the proportion of infections caused by *Candida* species (24% compared with 4.8%), but numbers were small overall.

The majority were prescribed ear drops (95%), with combination steroid/framycetin the most commonly used (47.5%). When a second ear drop was prescribed it was most likely (31.3%) ciprofloxacin. Oral antibiotics were prescribed in 30.3% of cases overall, but regional variation was noted (15.8–36.6%). More than two-thirds (68.9%) were managed with only one visit to that GP, and 8.2% were referred to an ear, nose and throat (ENT) specialist.

Statistically significant associations were found between:

- presence of a comorbidity and having a swab taken ($p=0.041$)
- having a swab taken and use of oral antibiotics ($p<0.001$)
- number of GP visits and use of oral antibiotics ($p=0.001$)
- presence of a comorbidity and referral to ENT specialist ($p=0.006$).

Phase 2

Thirty-nine questionnaires were returned by GPs working at the participating practices (Table 3). Due to the turnover of GPs during the extended period of the project, and the varied methods of questionnaire distribution, an exact response rate is difficult to determine. Based on the current staffing levels of these practices, we estimate our response rate to be over 90%. This was achieved by having local GP coordinators and practice nurses distributing and collecting the questionnaires personally.

The majority of GPs (94.4%) reported seeing more than 10 cases of AOE per year, with 47.2% seeing more than 30 per year. The majority (74.4%) routinely enquire about middle ear disease, but less do so about diabetes and immunosuppression (48.7% and 17.9%). Swabs are not used routinely (17.9% reported taking a swab at initial presentation), but more than half (56.4%) report swabbing if the patient fails to improve. Almost half (46.2%) the GPs will take a swab if the case is clinically severe. However, 74.4% of GPs find swabs only sometimes or rarely useful.

General practitioners identified the same three most prevalent pathogens found by the audit. More than half (51.3%) reported syringing to clean the ear, 41% use dry swabbing, but 12.8% state that cleaning is not usually required. Only 7.7% use suction under microscopic control as recommended in guidelines.

Relatively few GPs (23.1%) reported using oral antibiotics, and topical combination steroid/framycetin drops are their preferred prescription medication (50%), consistent with the audit findings. Almost half (48.7%) of GPs insert wicks to manage AOE.

Phase 3

Practices recruited 49 patients with AOE who agreed to have a swab taken and provide relevant clinical information (Table 4). The practice nurse completed a form that included risk factors, management provided and swab results.

Patients were predominantly male (72.3%) and slightly older than

the audit population (mean age 40.8 years). Swimming was cited as the most commonly reported contributing factor (23.4%); 36.1% had a documented comorbidity. Ear cleaning was done by syringing (29.8%) and dry swabbing (14.9%), but no method of cleaning was documented for 42.6%. The majority (89.4%) were prescribed ear drops, with 8.5% having two different drops. Oral antibiotics were given to 25.5% of cases.

P. aeruginosa was the most common pathogen isolated (55.3%), with candida (10.7%), aspergillosis (4.3%) and *Staphylococcus aureus* (8.6%) also noted. No pathogen was isolated in 34.0% of cases. The swab result was not responsible for any change in treatment in 74.5% of cases.

Table 3. Phase 2 – GP questionnaire

Factor studied	% (n=39)
Number of cases seen per year	
• <10	5.6
• 10–30	47.2
• >30	47.2
Management	
• Enquiry about comorbidities	
– diabetes	48.7
– middle ear disease	74.4
– immunosuppression	17.9
• Contributing factors seen	
– swimming	100
– hearing aid	71.8
– trauma	59.0
• Cleaning method used	
– suction	7.7
– syringing	51.3
– dry swabbing	41.0
• Timing of swabs	
– initial presentation	17.9
– follow up visit	56.4
– clinically severe	46.2
• Usefulness of swab	
– rarely useful	23.1
– sometimes useful	51.3
– very useful	25.6
• Preferred ear drops	
– framycetin/steroid	50.0
– ciprofloxacin	26.3
• Use oral antibiotics	23.1
• Wick inserted	48.7
• Have referred to ENT	84.6
Named as common pathogen causing AOE	
– <i>Pseudomonas</i>	84.8
– <i>S. aureus</i>	56.4
– fungal	51.3

Table 4. Results of phase 3 – clinical reports

Factor studied	% (n=47)
Mean age	40.8 years (range 4–87)
Male	72.3
Comorbidity (all)	36.1
• Diabetes	2.1
• Other	34.0
Contributing factors (all)	46.8
• Swimming	23.4
• Hearing aid	6.4
• Other	17.0
Pathogen isolated (as either first or second pathogen)	
• <i>P. aeruginosa</i>	55.4
• <i>S. aureus</i>	8.6
• Aspergillus niger	4.3
• <i>Candida</i> species	10.7
• None	34.0
Method of cleaning	
• Dry swabbing	14.9
• Syringing	29.8
• Both	2.1
Pharmacological treatment	
• Ear drops used (total)	89.4
• Framycetin/steroid	34.0
• Ciprofloxacin	19.1
• Oral antibiotics prescribed	25.5
Other treatments	
• Insertion of wick	10.6
• Other	8.5
• Nil	76.6
Changes made after swab	
No	74.5
Yes	12.8
Referral to other provider	
• ENT specialist	6.4
• Not required	87.2

Discussion

This project provided an opportunity for a network of general practices to contribute a relatively small amount of professional time and resources to the completion of a clinically relevant and multifaceted study. The three phases allowed the topic to be explored from different perspectives – a retrospective description of past practice, a self reported survey of usual practice and a prospective study of management and gathering of microbiological data. The retrospective component of the study is subject to selection and measurement bias and on its own is not useful. However, there were several areas where the three phases showed alignment of results. General

practitioners estimated that they used swabs in around 20% of cases and this was confirmed by the audit. *P. aeruginosa* was found to be the causative pathogen in around half of the audit and prospective cases, with a large majority of GPs correctly identifying it as the most common pathogen. Swab results were found useful in managing only 25% of the prospective cases, a figure mirrored in the self reported GP survey.

According to clinical guidelines, oral antibiotics are only recommended for complicated AOE infections. In North Queensland, use of oral antibiotics in the audit was 30%, and 23.1% of GPs reported using them. The prospective study revealed an intermediate use rate of 25.5%. We are not able to analyse directly whether antibiotics were used only for complicated or severe infections. However, we saw in the audit results that oral antibiotic use was associated with more visits to the GP and with collection of a swab, both possible indicators of more severe infection.

Another area that is somewhat controversial is the use of ear syringing. Guidelines recommend against its use, however 62.1% of surveyed GPs reported using this method. In the prospective phase, ear syringing was performed in 29.8% of cases. The reasons for this inconsistency may be explained by lack of access to microscopy for suction.

In summary, the project has shown consistency in the causative pathogens and management of AOE in North Queensland. Clinical guidelines are generally followed, however, use of oral antibiotics varies between regions, and lack of access to preferred cleaning equipment leaves GPs little option but to use less preferred methods. Further research into the effectiveness and safety of different ear cleaning methods is recommended.

Conflict of interest: none declared.

Acknowledgments

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