

Management of sore throat in primary care

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Background and objective

The aim of this study was to examine the knowledge, attitudes and practices of general practitioners (GPs) in Victoria, Australia in the management of sore throat.

Methods

We conducted a cross-sectional survey of 100 GPs using a questionnaire with the same four case vignettes used in a 1994 Victorian study.

Results

Eighty-nine per cent of respondents indicated they would prescribe antibiotics to a child with a short history of sore throat and fever, with examination findings of fever, tonsillar pus and tender cervical lymph nodes. Only 18% of respondents indicated they would order a throat swab with culture to investigate the aetiology. Very few respondents indicated they would prescribe antibiotics to patients presenting with sore throat with clinical features consistent with a viral infection.

Discussion

This study suggests that there is a role for better communication of the gradual but practical changes of Australian sore throat management guidelines to GPs, which may reduce antibiotic prescribing.

ACUTE SORE THROAT is one of the most common reasons for patients to visit their general practitioner (GP) in high-income countries, including Australia.^{1,2} Children are particularly affected, with Melbourne data showing that about one-third of children aged 5–12 years have an episode of acute sore throat each year.³

Sore throat is the third most common condition for which Australian GPs prescribe antibiotics.⁴ Most cases of sore throat are viral in origin, with 15–36% caused by bacteria, predominantly group A streptococcus (GAS).⁵ Despite this, and despite changes in Australian therapeutic guidelines,⁶ antibiotics are frequently prescribed for many patients with sore throat. In one study of children with tonsillitis in Australian general practice, antibiotics were prescribed for more than 90% of patients in 1990–91 and 2002–03.⁴ A study of the prescribing habits of 856 Australian general practice trainees in 2010–14 reported that antibiotics were prescribed for 72% of patients (both adults and children) presenting with sore throat.⁷

A study performed in 1994 of the knowledge, attitudes and practices of Victorian GPs about sore throat management found that GPs commonly make a diagnosis of bacterial infection on the basis of clinical features alone, and prescribe antibiotics empirically without taking a throat swab,⁸ consistent with the clinical guidelines at that time.⁴ This study was a cross-sectional survey that used four case vignettes designed to represent common, uncomplicated examples of acute sore throat presentation to investigate the clinical management by GPs in Victoria (Box 1, Table 4).

Since that study, antimicrobial resistance has increased in prominence as a global issue requiring an urgent solution,⁹ and considerable research

has focused on initiatives to reduce antibiotic usage, including for sore throat management in primary care.^{10–12} As a result of this growing body of research,^{13–15} expert recommendations have changed. The Australian Therapeutic Guidelines currently recommend against routine treatment of acute sore throat,⁶ except for high-risk patient groups, including: patients aged 2–25 years in communities with a high incidence of acute rheumatic fever; patients with existing rheumatic heart disease; and patients with scarlet fever. The Australian Therapeutic Guidelines also suggest that it is reasonable to prescribe antibiotic therapy for unwell patients with sore throat.⁶

Australian guidelines do not provide guidance on the role of investigations for diagnosis of bacterial sore throat, perhaps because of the general recommendation against treatment. The available evidence suggests that it is not possible to diagnose GAS sore throat on clinical features alone, and the gold standard for diagnosis is a correctly taken throat swab with culture.^{16–18}

In the context of the changing expert perspective on sore throat management, our research aimed to investigate whether the knowledge, attitudes and practices of Australian GPs are reflective of current recommendations.

Methods

We conducted a cross-sectional study using a questionnaire to investigate the knowledge, attitudes and practices of GPs in Victoria in the management of sore throat.

Survey design and piloting

We designed a short survey accessible via an anonymous online link. The survey included demographic questions

about the GP's work status, and general questions regarding knowledge and approach to sore throat management. The survey replicated, with permission, the four clinical scenarios in the 1994 study (Box 1). In response to each scenario, GPs were asked for their clinical impression, whether they would order investigations (and if so, what investigations), and their recommendations for antibiotic treatment.

The survey was piloted with academic GPs within the Department of General Practice at the University of Melbourne and colleagues within the Department of Paediatrics at the Royal Children's Hospital. Participants of a pilot study completed the survey and provided feedback that was incorporated into the final survey design to improve clarity.

Population and sample

We recruited GPs using email contacts provided from the Department of General Practice at the University of Melbourne. An introduction to the study and electronic link to the survey was emailed to 457 practising GPs in total: 119 GPs within the Victorian Primary Care Based Research Network (VicReN) and 338 GPs affiliated with the University of Melbourne. Any GP who was part of the University of Melbourne, Department of General Practice research and teaching database was eligible to participate in this survey. To increase response rates, VicReN committee members were also approached by researchers to complete paper surveys.

Data analysis

Data were captured or entered in REDCap, and Stata 14.1 (StataCorp) was used for descriptive summary statistics.

Ethics approval

The study was approved by the Department of General Practice Human Ethics Advisory Group at the University of Melbourne (approval number: 1545923).

Results

Characteristics of responding GPs

A total of 103 (22%) eligible GPs participated, with 67 and 36 completing the electronic and paper surveys respectively. The majority of the respondents were based in metropolitan Melbourne and worked in group practices with a similar proportion of younger and older GPs (Table 1).

Approach to clinical scenarios

For the first vignette (Case 1), 88% of GPs indicated that the case scenario was suggestive of sore throat caused by GAS, and 89.3% recommended antibiotic treatment (Table 2). However, only 18% indicated they would take a throat swab.

In the two case vignettes that presented an adult and a child with symptoms and signs suggestive of a viral upper respiratory tract infection (Cases 2 and 4 respectively), nearly all respondents indicated they would not perform any investigations and would not prescribe antibiotics.

There were divided responses to the third clinical scenario (Case 3). Fifty-five

per cent of respondents indicated that their clinical impression was sore throat caused by Epstein-Barr virus and 27% by GAS. More GPs indicated they would take a throat swab in this scenario (37%) than in the first clinical vignette. Overall, 49% of respondents indicated they would prescribe antibiotics. Where respondents indicated they would prescribe an antibiotic, most chose penicillin (95.2%).

Across all four case scenarios, 94% of GPs recommended symptomatic treatment to patients with sore throat, either in isolation or in conjunction with antibiotics. Paracetamol was the most frequently recommended symptomatic treatment (88%) followed by non-steroidal anti-inflammatory drugs (43%).

Knowledge of sore throat management

Fifty-two of 100 respondents indicated that they follow guidance on sore throat management provided by the Australian *Therapeutic Guidelines* or the Royal Children's Hospital Melbourne clinical practice guidelines. The most commonly identified source of knowledge was learning acquired from medical school (63%). The main reasons for prescribing antibiotics are outlined in Table 3.

Discussion

Nearly all the GPs in our study chose not to prescribe antibiotics for the two case vignettes with clinical features consistent with a viral infection (cough, absence of fever). The majority of GPs in our study (89.3%) chose to prescribe antibiotics for Case 1 – the vignette of a child with a short history of sore throat and fever with clinical examination findings of fever, pus on the tonsils and tender cervical nodes.

Most GPs (81.6%) chose not to take a throat swab in Case 1. We found strong consistency between GPs in assigning a clinical diagnosis for cases 1, 2 and 4, with 88–98% of respondents forming the same impression for these vignettes and with low use of diagnostic tests. However, there was apparent diagnostic uncertainty between Epstein-Barr virus and GAS infection in Case 3, where 37% of respondents indicated they would order a

Box 1. The four case vignettes included in the survey administered to general practitioners in the study

Case 1: An eight-year-old girl presents with a 24-hour history of sore throat and fever. On examination, she has a temperature of 38.5°C, pus on both tonsils and tender cervical lymph nodes.

Case 2: A 28-year-old man presents with a history of sore throat for two days and non-productive cough. On examination, he is afebrile, has a red pharynx and his chest is clear.

Case 3: A 22-year-old woman presents with sore throat for two days and malaise. On examination, she has a temperature of 38°C, has pus on both tonsils with palatal petechiae and has tender cervical lymph nodes.

Case 4: A seven-year-old boy presents with sore throat for two days and fever. However, on examination, he is afebrile. He has large pink tonsils with no exudate and no other abnormality is detected.

Table 1. Characteristics of participating general practitioners

Characteristic	n	(%)
Age (years)		
29–45	27	28.7
≥46	67	71.3
Sex		
Female	52	54.7
Male	43	45.3
Year of graduation		
≥1990	46	48.4
<1990	49	51.6
Qualifications		
FRACGP or equivalent	82	85.4
Practice type		
Group	95	98.9
Solo	1	1.1
Practice location		
Metropolitan	81	89.0
Rural	10	11.0

throat swab and 52% indicated they would order a monospot test, suggesting that throat swabs are more likely to be ordered when clinical uncertainty exists rather than to confirm the presence of GAS.

The responses to the four case vignettes suggest that while GPs chose not to investigate or prescribe antibiotics to patients with clinical features suggestive of a viral upper respiratory tract infection, there has not been a change in practice in how GPs diagnose and treat patients with clinical features classically suggestive of GAS sore throat (fever, tonsillar pus, tender cervical nodes) when compared with a similar Victorian study conducted in 1994.⁷ In this previous study, 97% of GPs faced with Case 1 indicated they would prescribe antibiotics and 13% would carry out a throat swab, compared with 89% and 18% in our current study. Almost all GPs (95%) in the current study chose to recommend penicillin, compared with 75% in the 1994 study.

Subtle and gradual changes to the management of a common presentation, such as sore throat, in the Australian *Therapeutic Guidelines* may not be noticed by busy GPs. The 1984 edition of the Australian *Therapeutic Guidelines* stated that: ‘less than 50% of sore throats are of

bacterial origin and many will not need treatment with antibiotics at all’.¹⁹ The 1990–91 edition stated that sore throat is mainly of viral origin and antibiotics were not recommended for their management.⁴ The current online version of the Australian guidelines, in relation to sore throat, begins with the statement: ‘Avoid the routine use of antibiotic therapy for acute pharyngitis and/or tonsillitis’.⁶ The second-ranked and third-ranked reasons for antibiotic use in our study were the prevention of suppurative complications and prevention of non-suppurative complications respectively, despite Australian guidelines highlighting that non-suppurative complications are rare, and routine antibiotic use for this reason is not indicated in low-risk groups.⁶ The Australian guidelines provide guidance for the management of many different conditions, and details on sore throat management are brief. By contrast, dedicated stand-alone and extensive sore throat guidelines exist in the US¹⁰ and Europe.¹¹

A recent study of the prescribing habits of Australian general practice trainees highlighted that in ‘real life’ there is a high rate of antibiotic prescribing for sore throat.⁷ A qualitative follow-up study highlighted that trainees are taught the importance of evidence-based antibiotic prescribing, particularly in relation to antimicrobial resistance.²⁰ The study observed that general practice trainees hold generally positive attitudes to guidelines, but noted other factors influenced their prescribing decisions, including patient and system factors, diagnostic uncertainty, transitioning from hospital medicine to primary care, and the habits of, and relationship with, their supervisor. In our study, patient factors including clinical severity (68%) and patient expectations (20%), as well as diagnostic uncertainty (27%), were indicated by GPs as influences on their prescribing practice.

The apparent low use of throat swabs and tendency to diagnose bacterial sore throat on clinical grounds observed in our study is not unique to Australia.²¹ A study of Canadian GPs observed that many clinicians based decisions about

Table 2. The approach of general practitioners to investigation and management

	Case 1	Case 2	Case 3	Case 4
Total n (%)	103 (100%)	103 (100%)	102 (100%)	101 (100%)
Clinical impression: Clinical impression of general practitioners to sore throat in different case scenarios				
GAS	91 (88.3%)	0 (0%)	27 (26.5%)	0 (0%)
Viral	4 (3.9%)	101 (98.1%)	5 (4.9%)	91 (90.1%)
Epstein–Barr virus	2 (1.9%)	0 (0%)	56 (54.9%)	1 (0.1%)
Uncertain	6 (5.8%)	2 (1.9%)	14 (13.7%)	9 (8.9%)
Investigations: How many GPs ordered investigations?				
Throat swab	19 (18.4%)	0 (0%)	38 (37.3%)	6 (5.9%)
Monospot	4 (3.9%)	0 (0%)	54 (52.9%)	1 (0.1%)
Management: How many GPs prescribed antibiotics or recommended symptomatic treatment?				
Antibiotic	92 (89.3%)	1 (0.9%)	50 (49.0%)	3 (2.9%)
Symptomatic	101 (98.1%)	99 (32.0%)	95 (93.1%)	95 (94.1%)

GAS, group A *Streptococcus*

antibiotic treatment largely on clinical judgement, despite North American expert recommendations for taking throat swabs.²² Of 128 respondents in the Canadian study, 22% and 41% respectively indicated they would take a throat swab in adults and children presenting with sore throat. Approximately half of the respondents indicated they could differentiate GAS and viral sore throat on clinical grounds alone, which is not supported by previous studies.^{16–18}

A potential driver for low use of throat swabs is the relatively slow turnaround time for results (at least 24 hours), which can be inconvenient in the context of general practice where management decisions are usually made within the consultation.²³ Rapid antigen detection tests are a potential solution but are not currently widely available to Australian GPs. A 2005 US study found that rapid antigen detection tests are available to most (90%) US primary healthcare physicians, and that, when they are available, 93% of physicians use them.²⁴

There are a number of limitations to this study. First, we used a questionnaire with case vignettes that were simplified and so may not adequately reflect the complexity of real-life cases, and GP responses may have been biased towards reporting guideline-oriented behaviour rather than actual practice. Second, while our survey design attempted to incorporate evidence-based recruitment strategies to maximise survey response rates,²⁵ our response rate was 22.4%. This is consistent with survey response rates reported in primary care research.²⁶ Third, the survey enrolled GPs with links to a university department and therefore may not reflect the broader population of GPs in Victoria. Data from the Australian Institute of Health and Welfare on 2015–16 GP workforce statistics indicate that the demographic features of the GPs in our study did not substantially differ to Victorian GPs overall.²⁷ In that report, 63.2% of Victorian GPs were aged over 45 years, compared to 67% of the GPs in our study. The same report indicated that 44.6% of Victorian GPs were female (54.7% in our study), and 75.1% practised in a metropolitan area (89% in our study).

Table 3. Reasons for prescribing antibiotics to patients with sore throat

Reason (General practitioners were able to select multiple options)	n (n = 100)
Patient appears extremely unwell	68
Reduce risk of suppurative complications (eg peritonsillar abscess)	67
Reduce risk on non-suppurative complications (rheumatic fever, glomerulonephritis)	63
Diagnostic uncertainty	27
Patient expects to be prescribed antibiotics	20
Reduce duration of symptoms	30
Reduce pain	10
Leads to a shorter consultation	2

The results of this study suggest that there is a role for communicating and highlighting to practising GPs the gradual but practical changes to guidelines on sore throat management in Australia, particularly in the context of increasing antimicrobial resistance, possibly through more expansive, dedicated sore throat guidelines. The study also highlights the potential role of quick, accurate point-of-care tests, such as rapid antigen detection tests, to diagnose bacterial sore throat in high-risk groups, as well as the potential to expand research into alternative effective symptomatic treatment.

Implications for general practice

- In Australian primary care, sore throat results in the prescription of an antibiotic in 72–90% of cases, despite bacterial infection causing <30% of cases.
- Nearly all the GPs in this study chose not to prescribe antibiotics for the two case vignettes with clinical features consistent with a viral infection (cough, absence of fever). The majority of GPs in this study chose to prescribe antibiotics for Case 1 – the vignette of a child with a short history of sore throat and fever with clinical examination findings of fever, pus on the tonsils and tender cervical nodes.
- Clinical practice may be improved by further education about the inaccuracy of clinical features to

diagnose GAS sore throat. Australian guidelines no longer recommend routine treatment of GAS sore throat for the prevention of rheumatic fever, except in high-risk groups.

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Table 4. Response of general practitioners in 1994 to four clinical vignettes

	Number who chose to prescribe antibiotics	Total number of respondents	Proportion
1. Child with tonsillitis	266	274	97.1%
2. Adult with viral URTI	26	274	9.5%
3. Adult with EBV infection	191	274	69.7%
4. Child with viral URTI	79	275	28.7%

EBV, Epstein–Barr virus; URTI, upper respiratory tract infection

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