Sore throat management in general practice

Paul Little and Ian Williamson


This paper discusses primary care management of sore throat in the context of recent national ‘consensus’ guidelines from the Drugs and Therapeutics Bulletin. The guidelines advise taking a throat swab, using typical clinical features where swabs are not available, and suggest that antibiotics shorten the duration of symptoms and prevent complications. Systematic reviews and individual studies indicate that the evidence for prescribing antibiotics for most presentations of sore throat in general practice is marginal, and the benefits are probably outweighed by the likely costs of antibiotics. Using clinical scorecards or symptom clusters to identify individuals who would benefit from treatment is insensitive with low predictive value, although inexpensive. Using throat swabs as a gold standard for diagnosis is inappropriate since they are neither very specific nor sensitive, and will greatly increase costs of management. The relative lack of evidence for the efficacy of antibiotics and for the use of throat swabs from primary care research, and also an unbalanced perspective of dangers and complications related predominantly to a secondary care setting, underlines the problem of achieving valid consensus guidelines. Guidelines not firmly based on evidence appropriate to the intended setting are more likely to be received sceptically and hinder getting research into practice.

Keywords. Sore throat, clinical guidelines, tonsilitis, pharyngitis, throat swab.

Introduction

Although sore throat is one of the commonest conditions managed in primary care, management is still controversial, and guidelines which suggest changing management are likely to have significant implications for both patients and the National Health Service. The principle of ‘getting evidence into practice’ and the use of guidelines is also particularly topical: guidelines should be based on good evidence, be feasible and be appropriate for the setting in which they will be used.

What national guidelines are available for the management of sore throat in primary care? The respected and widely read Drugs and therapeutics bulletin (DTB), which develops consensus guidelines through an expert panel system, recently reviewed the diagnosis and treatment of sore throat. All UK general practitioners (GPs) receive the DTB and thus it is a very influential source of advice and guidance for primary care. Their guidelines advised (i) taking a throat swab since “the precision in diagnosis is greatly increased”; (ii) where throat swabs are not possible, targeting treatment according to “typical clinical features”; especially in children; (iii) that antibiotics shorten the duration of symptoms and prevent complications.

What is the evidence in each of these areas? This deserves critical discussion not only because they are important scientific and clinical issues for a very common clinical problem, but also in the context of guidelines and applying evidence in practice. This paper first discusses the burden of disease in primary care. Then we will deal with the evidence for the efficacy of antibiotics, of the use of throat swabs and of targeting treatment to particular groups according to clinical signs.

Burden of disease for primary care

Estimates of attendance rates (per capita per annum) for sore throat vary: 0.08-0.20 for pharyngitis and tonsillitis in single practices, 0.2 for sore throats in a region, and for the—possibly atypical—practices in the national morbidity survey approximately 0.1 (assuming 1 in 4 ‘respiratory’ attendances are for sore throat and allowing for re-attendance). Using the latter conservative figure along with UK populations estimates, and assuming that a consultation costs £10, then the cost of the GP consultations for sore throat is approximately £60 million per annum even if no drugs are prescribed—let alone other costs (see below). The health service burden is increasing—a 14% increase for respiratory attendances since the last
morbidity survey—despite no obvious change in the pathological basis for sore throat during the last 30 years.

**Extra cost implications of throat swabbing**
The cost of swabbing all acute sore throats routinely in general practice would be approximately £40 million annually, assuming £4 per swab and probably at least £3 for the extra time (2–3 min organizing the swab, feeding back results to patients, pulling notes, documenting results, writing notes, writing scripts, etc.).

**Do antibiotics prevent complications?**

**Rheumatic fever (RF) and glomerulonephritis (GN)**
The studies on the prevention of RF were carried out using penicillin injections on post-war barracked military personnel, where attack rates were high (0.3–5%). This may not be generalizable to the use of oral antibiotics in a modern community setting with lower attack rates, and where only 50% of children complete a 10-day course. Individuals who have had oral antibiotics in general practice may be as likely to develop RF or GN as those not taking antibiotics.

The incidence of RF probably declined well before the advent of antibiotics. In the USA, but not the UK or Europe, the incidence temporarily increased in the 1980s and the steady decline since 1984 is difficult to attribute to antibiotics since most subjects do not present to health professionals. The average UK GP during a lifetime of practice has an approximately one in five chance of seeing a case of either post-streptococcal GN or RF following a sore throat.

The principal problem of prescribing to prevent RF and GN is that subjects may not have a significant sore throat, and those with sore throats mostly do not attend their GP. Even if oral antibiotics in the community were of proven benefit, either GP surgeries would need to be overwhelmed with patients or antibiotics would need to be freely available in the community to effectively prevent such complications. This would result in greater likelihood of penicillin resistance and greater use of more expensive drugs.

**Septicaemia**
The DTB underlined this complication, and quoted a case review where the mortality from streptococcal bacteremia was 50%. Although there have been more case reports of serious streptococcal infections in Europe and the USA in the past 5 years, this may not reflect a true increase. Furthermore, the majority are associated with an initial soft tissue focus (e.g. skin, muscle, fascia) or deeper focus (e.g. empyema, osteomyelitis) rather than pharyngitis, and with strains not typical of pharyngeal types. This is also borne out in the above UK case series; in only one of the cases was the throat described as the possible initial source, and the patient would not have been a candidate for a trial of no antibiotics in any case (the initial provisional diagnosis was meningitis). Thus it is misleading to imply that streptococcal septicaemia could be prevented by antibiotics prescription to patients attending GPs with the normal range of presentation of sore throat.

**Suppurative complications**
There is some evidence for a small protective effect of antibiotics on the likelihood of developing either otitis media or sinusitis. However, these studies are old and took place when the complications were more common, involved small numbers of complications in any case and were mainly on institutionalized servicemen, so it is again very difficult to extrapolate the results to modern general practice. The two studies addressing the issue in general practice had wide confidence intervals for the odds ratio for developing complications (greatly overlapping 1 for the prevention of otitis media).

There have been few studies addressing the issue of the prevention of quinsy using oral antibiotics: a post-war study in a military setting used intramuscular penicillin. Quinsy did apparently decline significantly after the war, but how much of this is due to improved socio-economic conditions and how much due to antibiotics is not clear. John Fry, in a review of complications of sore throat in 30 years of practice (3000 cases of tonsillitis and presumably an equivalent number of pharyngitis), documented three cases of serious cervical adenitis and 20 cases of quinsy all of which settled with parenteral antibiotics (hence were possibly peri-tonsillar cellulitis and not ‘true’ quinsy) and no other complications; his prescribing for sore throats is 25% (i.e. a low prescriber). A search of computerized notes (1990–1995) of 8000 current patients in our practice serving a deprived area of Southampton revealed 14 diagnoses of ‘quinsy’ or ‘early quinsy’: only three attended with a prior sore throat; two of these had oral antibiotics which did not prevent quinsy developing. All cases settled with parenteral penicillin (hence were possibly peri-tonsillar cellulitis). Thus quinsy or peri-tonsillar cellulitis is rare and most cases do not present to the GP with prior sore throat.

Hence there is considerable doubt from current evidence that oral antibiotics will effectively prevent complications of sore throat, which are rare in any case.

**Do antibiotics reduce symptom burden?**
The evidence for symptomatic relief in sore throat is also marginal. Of the five placebo controlled trials done in general practice, there may be a small improvement in the number of patients well after 3 days
Could a subgroup be targeted to improve outcome, and would this affect prescribing?

Could particular subgroups be identified? Unfortunately, symptom clusters do not seem to be a good indicator of streptococcal infection or antibiotic response. The symptom clusters do not seem to be a good indicator of antibiotic response. The 33 symptom clusters do not seem to be a good indicator of antibiotic response. The outcome, and would this affect prescribing?

Could particular subgroups be identified? Unfortunately, symptom clusters do not seem to be a good indicator of streptococcal infection or antibiotic response. The outcome, and would this affect prescribing?

Similarly, antibiotics have been exposed to if they were not given antibiotics, more patients will be exposed to the whole range (i.e. 20-50% of individuals with sore throat and GABHS-positive swab, and identifying patients with GABHS-positive throat swabs, patients treated early with antibiotics will be symptomatically better off by 12% for the 3-5 days following taking antibiotics, but 20% more patients will be exposed to the whole range (i.e. 100%) of symptoms due to relapse that they would not have been exposed to if they were not given antibiotics, i.e. probably cancelling any net benefit. Thus antibiotics probably do not reduce the symptom 'burden'.

Another major problem in prescribing antibiotics to ease symptoms is the evidence from placebo controlled trials (in Group A Beta Haemolytic Streptococcus (GABHS)-swab-positive patients) that the recurrence rate is significantly higher in subjects treated with penicillin immediately compared to treatment delayed for 48-56 hours (37% and 16% respectively relapsed within 4 months). This may be due to preventing immunity to streptococcus developing. The effect of delaying antibiotics on symptom resolution is similar to not giving antibiotics at all irrespective of initial presentation with fever, purulent tonsils or lymphadenitis (see Figure 1).

More patients will be exposed to the whole range (i.e. 100%) of symptoms upon relapse if they would not have been exposed to if they were not given antibiotics, i.e. probably cancelling any net benefit. Thus antibiotics probably do not reduce the symptom 'burden'.

Costs of prescribing

The marginal benefit of prescribing must be weighed against the possible costs. Routine prescribing encourages dependence and re-attendance. The sensitivity and specificity of the throat swab are low—26-30% and 73-80% respectively—when compared to a rise in the anti-streptolysin O titre (ASOT) titre. The ASOT titre is likely to be more important than throat swab in predicting outcome in view of the 100% association between definite cases of RF and either high initial level of ASOT or a rise in ASOT. The low predictive value of throat swabs relates to the high symptomless carrier rates—6-10% especially in children. The DTB conclusion that streptococcal ‘infection’ is ‘more common’ in children may just reflect higher carriage rates.

Even if throat swabs were taken there is the difficulty of using the results in changing treatment decisions: even with a rapid antigen test, where the results were available comparatively quickly (within hours, unlike the 48-56 hours for the throat swab), the results made a difference to prescribing decisions in only 13% of cases.
We argue that the evidence for prescribing antibiotics for a sore throat is marginal. Complications are rare, and on current evidence may not be preventable by prescribing for sore throat in primary care. The benefits are probably outweighed by the likely costs of antibiotics: the complications, including death (rare); diarrhoea and allergy (common); relapse (common); medical dependence and associated health service costs (common); and possible unknown psychological costs. The exception would be the rare individuals who are septicaemic or with quinsy where the risks of not treating are likely to be much greater.

Using clinical scorecards or symptom clusters to identify individuals who would benefit from treatment is insensitive with low predictive value, although inexpensive. Using throat swabs as a gold standard for diagnosis is inappropriate since, although they are reasonably specific, they are insensitive and not very predictive and will greatly increase costs of management.

GPs should share with patients the evidence about the modest efficacy, likely complications and relapse rate with antibiotics for most presentations of sore throat, and negotiate to improve the symptomatic management of sore throat without relying routinely on antibiotics.

The relative lack of evidence for the efficacy of antibiotics and for the use of throat swabs from primary care research, and also an unbalanced perspective of dangers and complications related predominantly to a secondary care setting, underlines the problem of achieving valid consensus guidelines. Guidelines which are not adequately based on evidence in the setting in which they will be used, and do not sufficiently take account of the practical implications of implementation, are likely to be received sceptically and adhered to poorly and will hinder getting research into practice.

References

Sore throat management