Is it possible to decrease antibiotic prescribing in primary care? An analysis of outcomes in the management of patients with sore throats

Claire M Cox and Marion Jones


**Objectives.** The aim of this study was to assess whether it was possible to change clinical practice through the introduction of an evidence-based protocol for the management of sore throats. The impact of the changed clinical practice on patients was also assessed.

**Method.** An observational study was carried out comparing management of patients with sore throats in a semi-rural general practice (14 000 patients), before and after the introduction of an evidence-based protocol, using a multidisciplinary approach. All patients over the age of 2 years presenting with sore throats as their chief presenting complaint were included in the study which ran for two 6-month periods: February–July 1997 (n = 435) and February–July 1998 (n = 350). Antibiotic prescribing rates, consultation and reconsultation rates, duration of sore throat, analgesia requirements and satisfaction were assessed.

**Results.** Antibiotic prescribing was significantly reduced in period 2 (56% compared with 19%). Consultation rates decreased by 19% in period 2. Median number of days to recovery of sore throats was the same in both groups. Reconsultation rates and dissatisfaction rates were the same in both groups.

**Conclusion.** Using a multidisciplinary approach, it is possible to reduce antibiotic prescribing for sore throats significantly without adversely affecting outcome.

**Keywords.** Antibiotics, prescribing, primary care, sore throat.

Introduction

Two hundred consultations per 1000 population take place each year for minor respiratory illnesses, and about one-third of these are specifically for sore throats. Up to 80% of patients who present with sore throats are treated with an antibiotic. The cost of consultations alone for sore throats is £60 million a year. There are also concerns about increasing bacterial resistance to antibiotics which recently has been addressed by the House of Lords Select Committee on Science and Technology. Work has also suggested that prescribing antibiotics has a medicalizing effect on minor illness and tends to increase reconsultation rates.

This project analyses the management of sore throats by GPs and practice nurses based on a ‘common practice’ protocol, established in 1992, in our practice (Fig. 1). Discovering unacceptably high levels of antibiotic prescribing, we then revised the protocol.

The new protocol (Fig. 2) incorporated research evidence, suggesting little benefit of antibiotics in uncomplicated sore throats. The aim of the project was to assess whether it was possible, by these means, to decrease antibiotic prescribing and adopt evidence-based practice in primary care. The impact of changing to an evidence-based, low antibiotic policy on patient acceptability, recovery and consultation rates was also assessed.

Method

Sore throats have been managed in our practice (14 000 patients, semi-rural) by GPs and practice nurses according to agreed protocols since 1992. All patients aged 2 years and over presenting to the doctor or practice nurse in normal working hours with a sore throat as their chief presenting complaint were recorded for two 6-month periods (February–July 1997 and February–July 1998).
The study included patients presenting with typical pharyngitis and tonsillitis, but not those in whom these were incidental findings, or not the chief symptom.

The first period (period 1, February–July 1997) covered the original sore throat protocol, and the second covered the revised ‘low antibiotic’ evidence-based protocol (period 2, February–July 1998).

The initial ‘common practice’ protocol (Fig. 1) had been achieved by a consensus amongst GPs in the practice and was not evidence based. To achieve the evidence-based protocol, practice management, practice nurses and GPs were circulated with data from period 1, along with key articles from a literature search on the use of antibiotics in sore throats.3,5,7,8 A practice meeting was then held with doctors, nurses and managers working in small groups to devise a new evidence-based protocol. These protocols were then amalgamated and consensus achieved (Fig. 2).

Patients were asked to sign a consent form prior to entering the study (period 1 and period 2). Basic patient details were recorded as well as symptomatology and duration of illness. All patients were examined and treatment outcomes recorded.

At 5–7 days, one unblinded researcher initiated contact with each patient by telephone. Data were elucidated concerning any continuing sore throat symptom. Attempts were made to assess the volume of analgesia required by the patient. Reconsultation rates were also recorded and any continuing symptoms were noted. Patients who had continuing sore throat symptoms at this contact were contacted again at 1 month to assess their recovery and any serious sequela.

All patients consulting with sore throats were given an explanatory leaflet in period 2 explaining the lack of evidence to support antibiotic usage in uncomplicated sore throats.

Data were analysed as a case-controlled study. For categorical outcomes, the two groups were compared by means of a chi-squared test. For quantitative outcomes, a two-sample t-test was used to compare mean values. A non-parametric alternative (Wilcoxon–Mann–Whitney sum of rank tests) was used for data that could not be assumed to be distributed normally.

Ethics committee approval was sought and granted.

Results

A total of 435 patients presented with sore throats as their chief complaint in study period 1, whilst 350 patients presented in period 2 (consultation rates of 62 consultations/1000 patients/year and 50 consultations/1000 patients/year, respectively). This is equivalent to a 19% decrease in demand for appointments for this condition.

In period 1, 43% of patients (n = 188) saw the nurse and, of those patients, 27% (n = 51) were referred through to the doctor. In period 2, the respective figures are 36% (n = 125) and 14% (n = 17).

A similar sex distribution appeared in the groups in periods 1 and 2 (68% female compared with 70%). Identical numbers of patients (10%) had tonsillary exudate in period 1 (n = 42) and period 2 (n = 32).

Ninety per cent (n = 392) of patients were followed up at 5–7 days by the independent researcher in period 1 compared with 99% (n = 346) in period 2.

During the study, overall antibiotic prescription was decreased from 56 to 19% (Table 1). Data from our Primary Care Commissioning Group (East Hampshire) for the periods March–August 1997 and March–August 1998 (unfortunately February to July data were not available) showed that our practice’s penicillin V prescribing was reduced by 36.7% more than the average for our Primary Care Group (Katie Hovenden, personal communication).

Analysing the antibiotic prescribing in more detail in period 1, 83% (n = 35) of patients with tonsillar exudate received antibiotics compared with 25% (n = 8) in period 2. Nurses independently issued antibiotics to 42% (n = 58) of patients seen entirely by them (n = 137) in period 1 and to 4% (n = 4) of patients seen entirely by them (n = 108) in period 2. Of the patients referred by the nurse to the doctor, 88% (n = 45) received antibiotics in period 1 compared with 71% (n = 12) in period 2.
Significantly fewer patients felt that their sore throat had settled by 5–7 days in period 2 and more patients felt the need to take some analgesia (Table 2). However, analysing the data from both 5–7 days and 1-month follow-up, the median number of days for the sore throat to settle was the same for both periods 1 and 2. Patients’ perception of being back to normal health was also the same in both groups.

Despite the significantly lower usage of antibiotics, reconsultation rates were unaffected and satisfaction rates remained high. This is supported by similar numbers of patients feeling they could ask for an explanation of their symptoms and treatment in both groups. Patients recalled receiving more advice on home remedies during period 2 when fewer antibiotics were given.

Only two serious sequelae were recorded during the trial, one in period 1 and the other in period 2. In period 1, a patient developed quinsy. She had been given penicillin by the GP at initial contact and settled without hospital admission, though subsequently underwent tonsillectomy. A second case of quinsy occurred in period 2. This was in an 11-year-old boy who was not toxic and had no pus on his tonsils at presentation. He was not given antibiotics, but 2 days later presented with quinsy. This settled with oral penicillin and no hospital admission or other sequelae developed.

### Discussion

Research has shown that antibiotics have little impact on the recovery from sore throats in non-toxic patients. In an era when serious sequelae are declining, it has been stated that there is more chance of dying from anaphylaxis from antibiotics than from suffering severe consequences from an untreated sore throat. The Standing Medical Advisory Committee recently has recommended that no antibiotics should be prescribed for viral throats. The aim of this study was to see if it is practicable to decrease antibiotic prescribing in primary care and, if so, whether this decrease has any impact on patient outcomes.

The two main findings from the study were that antibiotic prescribing and consultation rates were reduced in period 2 without there being any adverse affect on patient outcome. The issue to be addressed is how

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<tr>
<th>Patient characteristic</th>
<th>Period 1</th>
<th>Period 2</th>
<th>Rate difference (95% confidence interval)</th>
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<tbody>
<tr>
<td>Prescribed antibiotics</td>
<td>56% (n = 243)</td>
<td>19% (n = 65)</td>
<td>0.373 (0.309–0.433)</td>
<td>P &lt; 0.0001***</td>
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| Table 1 | Comparative outcomes for periods 1 and 2
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| Table 2 | Follow-up at 5–7 days (and 28 days)
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<td>Sore throat settled</td>
<td>77% (n = 303)</td>
<td>70% (n = 242)</td>
<td>0.074 (0.010 to 0.137)</td>
<td>P = 0.023*</td>
</tr>
<tr>
<td>Median no. of days for sore throat to settle (includes data from 28 day follow-up)</td>
<td>4.0</td>
<td>4.0</td>
<td>0.167</td>
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<td>Back to normal health</td>
<td>58% (n = 227)</td>
<td>56% (n = 194)</td>
<td>0.016 (–0.056 to 0.087)</td>
<td>P = 0.665</td>
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<td>Required analgesia</td>
<td>80% (n = 315)</td>
<td>87% (n = 300)</td>
<td>–0.063 (–0.117 to –0.010)</td>
<td>P = 0.021*</td>
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<td>Required regular analgesia</td>
<td>52% (n = 205)</td>
<td>58% (n = 200)</td>
<td>0.035 (–0.104 to 0.017)</td>
<td>P = 0.134</td>
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<td>Mean no. of days regular analgesia required</td>
<td>2.04</td>
<td>2.55</td>
<td>0.019*</td>
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<td>Reconsultation rate</td>
<td>4% (n = 16)</td>
<td>6% (n = 19)</td>
<td>–0.014 (–0.047 to 0.017)</td>
<td>P = 0.369</td>
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<td>Dissatisfaction rate</td>
<td>5% (n = 21)</td>
<td>4% (n = 13)</td>
<td>0.016 (–0.015 to 0.047)</td>
<td>P = 0.301</td>
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<td>Recollection of advice about home remedies</td>
<td>63% (n = 249)</td>
<td>87% (n = 301)</td>
<td>–0.235 (–0.294 to –0.175)</td>
<td>P &lt; 0.0001***</td>
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<td>No. of patients who felt they could ask for an explanation</td>
<td>88% (n = 345)</td>
<td>83% (n = 289)</td>
<td>0.040 (–0.011 to 0.093)</td>
<td>P = 0.124</td>
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generalizable are these findings and what were the factors which engendered the change.

The study showed that there was a 19% reduction in demand for consultations for sore throats following the introduction of the evidence-based protocol. There are two possible explanations for this. It could well be that the incidence of sore throats in the community was less in 1998 than in 1997, or that media-led education campaigns resulted in fewer patients with sore throats choosing to consult the doctor. The other possible explanation is that the different management they received at the practice affected their decision to consult with future sore throats. A limitation of the methodological design of this study is that it results in us not having enough access to the background incidence of sore throats in the community. Therefore, any inference from the reduced consultation rate must be guarded. However, we do know, from other published work, that the type of interventions we implemented (e.g. decreasing antibiotic prescribing) can result in demedicalizing self-limiting conditions and that patient information leaflets are successful in increasing patient knowledge. Both of these factors may well have influenced the patients’ decision to consult.

The study showed that there was a 37% reduction in antibiotic prescribing after the introduction of the evidence-based protocol. This compares favourably with other studies which quote figures of 11 and 10% when doctors set themselves guidelines to reduce antibiotic prescribing for coughs and wheezy chests.

Moreover, it appears that practice nurses are adept at following agreed protocols for minor illnesses, having decreased their independently initiated scripts from 42% in period 1 to 4% in period 2. The question to be addressed is what factors were responsible for such a significant change in antibiotic prescribing.

Inevitably, the involvement in a research project may in itself be an incentive to change doctor’s prescribing habits—but this would obviously have impacted on the results of other published work too. The importance of the patient information leaflet on patient knowledge has been described already, and this in itself may have been helpful in reducing the doctor’s perception of patient pressure to prescribe. However, we feel that one of the main reasons for the success in implementing evidence-based practice is that we employed a multidisciplinary approach with proven educational methods to engineer the change. Studies have shown that active educational methods, such as the small group educational process, are more effective than passive methods at achieving sustained change in practice. Other work has suggested that peer education and feedback on performance can promote behavioural change. In our project, we involved the whole team in the development of the evidence-based protocol, based on a literature review and feedback on their performance in period 1. Multidisciplinary small groups were used to develop the protocol. Therefore, we used an educational process, which has been shown to be effective in other settings, and our success in reducing antibiotic prescribing may well be attributable to this.

Our data on recovery rates (median number of days for sore throat to settle, patients’ perception of being back to normal health) tend to support previous work, in that decreasing antibiotic prescribing does not adversely affect outcome. The greater volume of analgesia taken by patients in period 2 may reflect the advice given on our patient leaflet about symptomatic treatment for sore throats.

One of the hurdles to changing clinical practice often is that we perceive that patients will find the change unacceptable. However, in our study, satisfaction rates were consistent. The evidence was that in period 2 more advice and less medicine was dispensed, and perhaps this should be the message for engineering change in prescribing patterns in primary care.

Conclusion

Using a multidisciplinary approach, it is possible to reduce antibiotic prescribing for sore throats significantly without adversely affecting outcome. There is also evidence that patient education about the role of antibiotics may limit their need to consult for self-limiting illness.

Acknowledgements

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References

Reducing antibiotic prescribing for sore throats


