



This is an abridged version; the full version is on bmj.com

Department of Primary Medical Care, University of Southampton, Southampton SO17 3RT

Satinder Kumar *senior research fellow*
Paul Little *professor of health services research*

Concordance Unit, Department of Primary Care and General Practice, Guy's, King's, and St Thomas's, University of London, London SE11 6SP

Nicky Britten *director*

Correspondence to: S Kumar skk@soton.ac.uk

BMJ 2003;326:138-41

Why do general practitioners prescribe antibiotics for sore throat? Grounded theory interview study

Satinder Kumar, Paul Little, Nicky Britten

Abstract

Objectives To understand why general practitioners prescribe antibiotics for some cases of sore throat and to explore the factors that influence their prescribing.

Design Grounded theory interview study.

Setting General practice.

Participants 40 general practitioners: 25 in the maximum variety sample and 15 in the theoretical sample.

Results General practitioners are uncertain which patients will benefit from antibiotics but prescribe for sicker patients and for patients from socioeconomically deprived backgrounds because of concerns about complications. They are also more likely to prescribe in pressured clinical contexts. Doctors are mostly comfortable with their prescribing decisions and are not prescribing to maintain the doctor-patient relationship.

Conclusions General practitioners have reduced prescribing for sore throat in response to research and policy initiatives. Further interventions to reduce prescribing would need to improve identification of patients at risk of complications and be workable in busy clinical situations.

Introduction

Evidence shows that most sore throats are viral, self limiting, easily self managed, and do not require antibiotics.¹⁻³ Although there has been some reduction in antibiotic prescribing for all acute respiratory illness, including sore throat,⁴ little is known about the processes that led to this change and why general practitioners continue to prescribe for some cases of sore throat.

We explored general practitioners' reasons for prescribing antibiotics for sore throat and the factors that influenced their decision making. We also investigated general practitioners' clinical practice in relation to previous findings—for example, prescribing antibiotics to maintain the doctor-patient relationship, overestimation of patients' expectations for antibiotics, and discomfort experienced on prescribing antibiotics.^{5 6}

Participants and methods

We used grounded theory to guide sampling and collection and analysis of data.⁷ We initially constructed

a maximum variety sample of 25 general practitioners (table). Practitioners were recruited by telephone and selected from different places to avoid a regional bias from any one single context, local policy, or expert's advice. In keeping with grounded theory, we interviewed a further theoretical sample of 15 general practitioners (selection guided by the emerging analysis) to extend and challenge the existing data and to test the integrity of the findings.⁸

Data collection and analysis

SK conducted face-to-face, open ended interviews at participants' surgeries using an interview guide. Questions included opinions and beliefs about antibiotic prescribing in sore throat, management of patients consulting with sore throat, and awareness of research and policy on antibiotic prescribing and how these influenced clinical practice. General practitioners were encouraged to speak freely, raise issues important to them, and to support their responses with examples from clinical practice, research, and policy when appropriate. All interviews were audiotaped and transcribed verbatim. We used constant comparative analysis to interpret the data,⁷ and all authors contributed to the analysis independently (see bmj.com for details).

Results

All general practitioners agreed that antibiotics should be unnecessary for most patients with sore throat. They identified external pressures, such as research, local prescribing advisers, and national reports,⁹ that had

Table 1 Characteristics of 25 general practitioners in maximum variety sample

	No of GPs
Men	15
Women	10
Full time	20
Part time	5
MRCGP	20
Academic	3
Teachers and tutors	5
Trainer status	10
Practice:	
Suburban	15
Inner city	5
Rural	5

influenced them to reduce antibiotic prescribing. Most saw sore throat consultations as mundane and time consuming with a potential to generate disagreements.

General practitioners estimated they prescribed antibiotics for fewer than 1 in 10 to a maximum of half of patients consulting with sore throat. Only one general practitioner said he prescribed for half of those consulting, and he labelled himself as a high prescriber. However, all general practitioners said their decision making was rational and systematic: informed by personal clinical experience and research evidence and influenced by advice from policy makers and local microbiologists.

Beyond this, general practitioners' ideas and beliefs differed. The analysis is presented as four themes that are not mutually exclusive.

Decision making

All general practitioners believed that antibiotics are beneficial to some patients. They identified specific symptoms, signs, and contexts for which they would prescribe antibiotics.

GP: If the patient presents within 48 hours of developing a sore throat then I don't prescribe antibiotics. I mean there is plenty of evidence now to suggest that most of these cases are viral and self limiting and get better. I give them general advice on how to manage it, you know painkillers and gargles, and then I'll explain it'll cure itself. I only give antibiotics if it looks like it may be bacterial.

SK: What does a bacterial infection look like to you?

GP: Well, you can't tell if it's bacterial, but the possibility is certainly greater when the patient's had a sore throat for 4-5 days and it's getting worse. They may have a fever ($\geq 38^{\circ}\text{C}$) and look toxic.

SK: I wonder what you mean by toxic?

GP: Somebody with a high fever, bad headache, myalgia, and they just look awful and ill when they walk in. They'll have lymph nodes up and their throat will be red raw with dilated blood vessel just like raw meat. I get concerned that they'll get complications and so I'll give them the option and say, although there is not strong evidence it's going to make a difference, I'm quite happy to give them penicillin. But if they are not happy to take penicillin then I'm there with the painkillers.

Like others, this doctor acknowledged a virus could cause these symptoms and signs. However, the patient's appearance and the duration and severity of symptoms increased uncertainty about the causal agent and the potential for complications, which general practitioners listed as quinsy, streptococcal septicaemia, and rheumatic fever. General practitioners managed their uncertainty by prescribing or offering to prescribe an antibiotic. The general practitioner who said he prescribed antibiotics for half of his patients with sore throat explained his "high" prescribing was because he had once withheld antibiotics and the patient subsequently developed streptococcal septicaemia. Other doctors said that their antibiotic prescribing was influenced by previous patients.

If someone comes in really unwell—high temperature and looks toxic—and they've hardly ever been in to see me before, then I take them pretty seriously. They must have managed a lot of sore throats at home so it must be bad if they've come in, so I'm more ready to prescribe an antibiotic.

A doctor who said he prescribed less than one antibiotic per 10 sore throat consultations thought toxicity

was used too readily to justify prescribing antibiotics when doctors faced uncertainty.

I think it's just like the old days when people would write pharyngitis in the notes if they wanted to prescribe antibiotics and sore throat if they didn't. I think toxic is the new pharyngitis—people use it too quickly.

However, other general practitioners did not support his view. Only one doctor said she took throat swabs when patients appeared toxic. She found most people improved while waiting for the swab result. However, she did prescribe antibiotics when group A streptococci were isolated, even if the patient had no symptoms, although she knew that the bacterium could be a coincidental finding. None of the doctors described experiencing discomfort when prescribing antibiotics in the above contexts.

The presence of adverse social factors lowered general practitioners' threshold for prescribing antibiotics for sore throat. They were comfortable prescribing antibiotics for these reasons and explained how their practice was based on plausible biological assumptions, which linked poor diet with suboptimal immune function.

Responses to external pressures to reduce antibiotic prescribing

All general practitioners claimed to have reduced antibiotic prescribing in response to pressures from research findings, policy documents, and local prescribing advisers. One general practitioner and his partners had agreed to change practice policy to stop all antibiotic prescribing for sore throats, irrespective of how ill patients appeared or their social context. This decision was based on their interpretation of published research. They subsequently saw an unprecedented rise in the number of patients with quinsy (diagnosis confirmed on admission to hospital); numbers fell when they returned to prescribing antibiotics for the severest sore throat symptoms.

Other general practitioners who said research evidence primarily guided their decision making described strategies used to reduce or prevent patients raising the issue of antibiotics.

If you are going to deal with these people, if you are going to see lots of people coming in with sore throats, then you have to be tough if you are going to follow the evidence. So, if there is a little epidemic of sore throat and you start dealing with the first ones that come in and explain things to them in a way that by the time they go out they say, "What a waste of time"—so when they see the rest of the family they say, "Well it's a waste of time going to see the doctor because he just told me to go home and suck on an aspirin."

Another doctor stuck notices at reception and on the side of his consulting desk to deter patients from asking for antibiotics. The notices read: "Please do not ask the doctor for antibiotics as refusal often offends."

These behaviours were extreme compared with those of other doctors in our samples. Both these doctors aimed to make patients uncomfortable about attending with sore throat or asking for antibiotics.

Clinical experience, length of service, and research evidence

A general practitioner in practice for 25 years described how he balanced personal experience with research evidence:

I'd say I prescribe antibiotics for three in every 10 I see. When I first started, I prescribed very little—it was very low, it was actually lower than it is today. I was very strict and just stuck to the facts. Now it [antibiotic prescribing] has increased. My antibiotic prescribing for sore throat has

waxed and waned over the years, and at the moment it is less than it's been at other times but not as low as when I started. So now I prescribe when I feel under pressure or if I'm running late as duty doctor when it's too much to go through the detailed process of saying sore throats are caused by viruses and they will get better anyhow, etcetera. When I'm in surgery I do that more often but not as duty doctor—it's too busy. However, I feel I am prescribing in response to what people are actually like, and you know not all will be satisfied, or you know some people will not be satisfied unless they get their antibiotic and I know who those people are, so when they come in I give them antibiotics. I think research into this has been helpful, but I've learnt a lot from the hundreds of patients I've seen with sore throats too. People aren't always as research would have them.

This doctor's prescribing responded to external pressures (policy and research) acting over the long term and to daily pressures of clinical general practice. Understanding why a doctor switches from acting as a low to high prescriber of antibiotics in different contexts is important for developing interventions that aim to change behaviour.

Delayed prescribing

Few general practitioners described using delayed prescribing. On the whole it was regarded positively, and general practitioners thought it could be used to manage diagnostic uncertainty, to reassure the patient, to prevent reattendance, to reduce the likelihood of a patient taking the antibiotic, and to shorten consultation time.

GP: I try and give a delayed prescription where I can and say don't use this for 48 hours, and if it hasn't gone away or it's getting worse then cash it in.

One general practitioner questioned the effect of delayed prescribing on patients, suggesting its effects were no different from issuing a prescription for antibiotics:

GP: I don't use delayed prescribing I feel that makes it just, well, you're just hedging your bets. You are either sure of what you're doing or you're not sure of what you're doing. So, if you see a sore throat you're either saying you're sure it's viral and self limiting and going to get better or you're not.

Another general practitioner who said he was a low prescriber thought delayed prescribing was most useful to high and medium prescribers of antibiotics because of its potential to reduce peoples' consumption of antibiotics. He also thought it was an indicator of patient centred consulting as the choice was left to the patient. Another general practitioner thought leaving the prescription in reception for the patient to collect after 48 hours was paternalistic, diminished the trust between patient and doctor, and was ultimately disempowering to the patient. General practitioners who handed the prescription to the patient and asked them to delay avoided creating such perceptions.

Antimicrobial resistance

General practitioners agreed that overuse of antibiotics would lead to the development of antimicrobial resistance. However, they were sceptical that prescribing penicillin for sore throat contributed to this greatly.

I don't think GPs contribute in any significant way, not really, and I think we are being targeted unfairly. Most GPs try desperately hard not to prescribe antibiotics, and it's really a fallacy to say we overprescribe. For instance, look at

penicillin; look at how long this has been around. OK, tell me why it still works in the community if we're supposed to be causing resistance through its overuse. My argument is that I saw much more co-amoxiclav being used in hospitals than I ever did in general practice. And now we hear about antibiotics being used willy-nilly in farming, so looking at our prescribing of penicillin for sore throat is nonsense to me.

Maintaining doctor-patient relationships

Prescribing antibiotics for sore throat was acknowledged as relevant but not the most important factor in maintaining the doctor-patient relationship:

Withholding antibiotics is not the worst thing I do in terms of the doctor-patient relationship. After all, my patients know me well enough by now. They know I base my advice by considering their story alongside the medical evidence. The sore throat doesn't exist in isolation—often I've seen the same person with blood pressure, depression, diabetes, the list goes on—so, no, my relationship with my patients isn't that fragile.

One doctor who described himself as a low prescriber highlighted his difficulties in negotiating with patients who demanded antibiotics because they believed in their effectiveness. Other general practitioners also highlighted that 5-10 minutes was not enough to convince such patients. One said he resolved this tension by reminding himself of his holistic duty.

GP: Once patients have worked out what they want, to actually explain them out of it can be a long process. I know people who will come in here and say antibiotic x doesn't work for me can I have y instead—I mean, I find it hard to explain ... how to communicate the science doesn't support what they believe. So for sore throat I have to think is it the bacteria, the virus, or patient you are giving the antibiotic for. So if I think I'm treating the whole patient and not just the virus then I feel better about giving the antibiotic here—because there is a holistic duty here.

Other general practitioners described similar tensions when patients reattended with sore throat or when patients were unable to understand "complex explanations"—for example, because of lack of English language.

Only a few general practitioners said they actively explored patients' concerns when they attended for sore throat. These doctors spoke of sore throat consultations as complex, requiring full intellectual attention and negotiation skills. This contrasted with the views of others, who saw sore throat consultations as mundane. Doctors using this style of consultation said they did not overestimate people's expectations for an antibiotic.

Comfortable prescribing decisions

None of the general practitioners interviewed described feeling very uncomfortable when prescribing antibiotics for sore throat. On the contrary, most felt they had reduced their prescribing in response to external pressures to a level they were comfortable with.

I feel very comfortable with what I am doing. I don't feel bad if I prescribe antibiotics for sore throat—even the advocates of not prescribing wouldn't say don't not prescribe 100% of the time.

I don't feel uncomfortable because I'm prescribing; I feel uncomfortable sometimes for not prescribing.

One doctor, who described herself as "very careful about prescribing antibiotics in any clinical context"

and used delayed prescribing strategies, said that consultations for sore throat were a welcome interlude in a busy surgery:

I don't know why we have all this media attention and scientific attention on sore throats when there are more pressing problems patients and GPs are facing. Sore throat makes up a small percentage of my workload, yet the attention you lot are giving it is out of proportion. I saw four people with depression and one with sore throat and it was a welcome relief to have a quick consultation with a definite resolution. And, yes, I gave an antibiotic and feel very happy with my decision.

All general practitioners admitted with probing that they occasionally prescribed antibiotics for sore throats to make the consultation quick. However, only the above general practitioner spontaneously spoke about this.

Discussion

We used grounded theory to guide collection and analysis of data because it allowed us to re-examine pre-existing assumptions and produce new understandings.⁷ We used maximum variety sampling, followed by theoretical sampling, because of its power to capture variation, consistency, and contradictions in responses. To minimise any differences between general practitioners' reported behaviour and actual practice, we asked doctors to support their responses by drawing on clinical experiences, and the researcher indicated his sensitivity to responses that might sound untrue.¹⁰ The figures estimated for numbers of antibiotics prescribed in this paper are supported by those from a recent survey (PL, unpublished data).

The design of our study differs from that of previous qualitative work.^{5,6} We used open ended interviews, with questions becoming more focused on the emerging themes as the study progressed. Our study was not limited to one region, which adds to the transferability of its findings.

Rationale for prescribing

Unlike in previous qualitative studies,^{5,6} general practitioners did not describe appreciable discomfort on prescribing antibiotics. Maintaining the doctor-patient relationship was not the primary reason for prescribing antibiotics. Nor did the general practitioners believe that withholding antibiotics greatly undermined or damaged the doctor-patient relationship in the long term.

When speaking in the abstract, general practitioners overemphasised patients' propensities to be dissatisfied and cause confrontation if denied antibiotics. However, these assumptions were not supported when general practitioners were asked to give clear examples from practice. Overall, general practitioners prescribed antibiotics by taking into account, to varying degrees, biomedical evidence, policy statements, social context, and service provision. General practitioners who questioned the relevance of research evidence for real life practice said that research was not conducted in comparable settings and with comparable populations. Clinical experiences and personal knowledge of patients were given as other factors that led to bypassing evidence.

The general practitioners recognised that antimicrobial resistance was a threat and accepted its rela-

What is already known on this topic

Prescribing of antibiotics for sore throat has fallen in the past 10 years

General practitioners overestimate patients' expectations for antibiotics

What this study adds

General practitioners are uncertain who benefits most from antibiotics for sore throat and are particularly concerned about complications

Maintaining the doctor-patient relationship was not the primary reason for prescribing antibiotics

Doctors are mostly comfortable with their antibiotic prescribing for sore throat

tion to prescribing behaviour, but questioned the notion that prescribing penicillin V for sore throat in the community was important in this respect.

Improving prescribing

We have identified areas of knowledge and information that may improve general practitioner decision making. For example, we found that general practitioners had difficulty in distinguishing people most at risk of complications.

General practitioners were clear about clinical contexts when antibiotics were more likely to be prescribed—for example, when acting as duty doctor, in difficult consultations, or when accumulated experience of individual patients was given priority over research evidence. Some general practitioners remained unclear about different delayed prescribing strategies. Style of consultation is also important in determining prescribing. Efforts to reduce antibiotic prescribing will need interventions that target the contexts where general practitioners over-ride policy and research evidence and are workable in clinical practice.

Contributors: See bmj.com

Funding: National primary care development award from the Department of Health.

Competing interests: None declared.

- Little P, Williamson I. Sore throat management in general practice. *Fam Pract* 1996;13:317-21.
- Del Mar CB, Glaziou P, Spinks AB. Antibiotics for the symptoms and complications of sore throat. *Cochrane Database Syst Rev* 2000;(4):CD000023.
- Howie JG. Respiratory illness and antibiotic use in general practice. *J R Coll Gen Pract* 1971;21:657-63.
- Prescription Pricing Authority. *Prescribing analysis and cost data*. London: PPA, 2002.
- Butler CC, Rollnick S, Pill R, Maggs-Rapport F, Stott N. Understanding the culture of prescribing: qualitative study of general practitioners' and patients' perceptions of antibiotics for sore throat. *BMJ* 1998;317:637-42.
- Bradley CP. Uncomfortable prescribing decisions: a critical incident study. *BMJ* 1992;304:294-6.
- Glaser B, Strauss A. *The discovery of grounded theory: strategies for qualitative research*. New York: Aldine, 1967.
- Glaser B. *Advances in the methodology of grounded theory: theoretical sensitivity*. Mill Valley: Sociology Press, 1978.
- House of Lords Select Committee on Science and Technology. *7th report on antibiotic prescribing*. London: Stationery Office, 1998.
- Adler P. Observational techniques. In: Denzin N, Lincoln Y, eds. *Collecting and interpreting qualitative materials*. London: Sage, 1998:79-109. (Accepted 5 November 2002)