PRACTICE OBSERVED

Practice Research

Acute pharyngitis: a symptom scorecard and microbiological diagnosis

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Upper respiratory tract infections are the commonest reasons for patients to consult their general practitioners, annually accounting for 240 consultations per 1000 patients, of which 40 patients will present with acute sore throat.[1] *Streptococcus pyogenes* is responsible for approximately 5 to 30% of acute sore throats and tonsillitis. The clinical differentiation between streptococcal and non-streptococcal infection remains poor,[2] however, and thus treatment with antibiotics is both variable and empirical.

The bacteriological investigation of acute pharyngitis in general practice is not always done.[3] Reasons for this are the geographical separation of the practice from the diagnostic laboratory, the necessary delay in obtaining a result early enough to influence the clinical management of the patient, and the repeat consultation that is necessary to start treatment. If bacteriological samples were processed in general practice these obstacles might be overcome.[4]

In the United States in attempts to discriminate between streptococcal and non-streptococcal infection scorecards that apply different weightings to various clinical features have been used.[4] We decided to evaluate such a scorecard in the diagnosis of *Strep pyogenes* pharyngitis and to assess whether it was possible to do simple bacteriological investigation in general practice.

Methods

The study was conducted by two trainees in general practice over four months in two general practices during their attachment. One practice had five partners and a list of 12 500 patients, the other was a rural prescribing practice with two partners and 3500 patients. Both were in purpose-built health centres.

The scorecard with nine items (table I) was a modification of that described by Breese[4] and was completed during each consultation. In addition an overall clinical assessment of the likelihood of a streptococcal throat infection was made. Once completed the scorecard was not used in the management of the patient.

For the bacterial isolation and identification of *Strep pyogenes* in pharyngeal swabs each practice was provided with a 37°C incubator (LEEC), 0·1 unit bacitracin discs, 0·0002% crystal violet horse blood agar plates, and a selective broth medium to detect haemolytic streptococci containing 5% horse serum, 0·0002% crystal violet, nalidixic acid 100 mg/l, and colistin sulphate 5×10^7 units/l in 4·5 ml nutrient broth.

Fresh supplies were obtained weekly from the hospital laboratory and refrigerated at 4°C. The equipment was placed and samples processed in an area separate from where patients were seen and a "laboratory" code of practice observed. The top of the incubator was a suitable work surface and was disinfected. All infected material was doubly wrapped and returned to the hospital laboratory for disposal.

Patients with sore throat were investigated non-consecutively. A throat swab sample from both fauces was plated onto the crystal violet blood agar medium and a bacitracin disc applied directly to the inoculated agar. The swab was then broken off into the haemolysin broth. Both plates and broth were incubated overnight at 37°C in candle extinction jars. The plates were subsequently inspected for β-haemolytic colonies and zone of inhibition around the bacitracin disc. At the same time 1 ml of sheep erythrocytes was added to the selective broth, which was further incubated for 1 hour at 37°C and then inspected for haemolysis.

Each trainee received one hour of training in these bacteriological techniques before starting the study. Samples read by the trainees were checked by a medical laboratory scientific officer, and all streptococcal isolates were grouped.

Patients were told to either telephone or attend the health centre the following day to find out whether they should redeem the prescription provided at their first visit. Patients with positive pharyngeal cultures were treated orally with penicillin V 250 mg four times a day for 10 days or erythromycin 250 mg four times a day if allergic to penicillin.

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Results

A total of 269 swabs was collected from patients with 269 separate episodes of pharyngitis; 219 were collected from the urban practice and 50 from the rural practice. Fifty-four (20%) samples were positive for *Strep pyogenes*. There were no false-negative readings by the trainees, though selective broth and agar samples from six patients and a further two broth samples were interpreted as falsely positive. This gave specificity scores for the broth and agar media of 96·4% and 97·3% respectively.

The distribution of the overall scores for patients determined by the scorecard, according to the results of the throat cultures, is shown in the figure. The mean symptom scores for patients who were culture-positive and culture-negative were 29·5 and 27·4 respectively, the difference being significant at $p < 0·02$. Analysis of each factor on the scorecard is shown in table II, in patients who were culture-positive the presence of an abnormal pharynx or abnormal cervical lymph nodes was significantly greater than for those who were culture-negative ($p < 0·001$).

TABLE I—*Ten-item scorecard*

	Score		Score
(1) *Month*		(2) *Age (years)*	
February, March, April	4	5–10	4
January, May, December	3	4, 11–14	3
June, October, November	2	3, 15	2
July, August, September	1	2	1
	Present	*Absent*	*Not established*
(3) Temperature 100·5°C	4	2	2
(4) Sore throat	4	2	2
(5) Cough	2	4	4
(6) Headache	4	2	2
(7) Abnormal pharynx	4	1	3
(8) Abnormal cervical lymph nodes	4	2	3
(9) Abnormal tympanic membranes	4	2	3
(10) Coryza	1	4	3
Total			

Modified after Breese[4]

TABLE II—*Analysis of each factor on scorecard according to result of throat culture (as determined by medical laboratory scientific officer on selective blood agar)*

Factor	Per cent positive for factor		SE of differences between (%) percentages	p = diff/(SE)
	Culture negative	Culture positive		
Fever	7·49	17·78	5·50	NS
Cough	61·53	47·12	7·55	NS
Headache	47·34	61·57	7·44	NS
Abnormal pharynx	82·00	90·23	3·69	< 0·001
Abnormal cervical lymph nodes	42·03	76·47	6·68	< 0·001
Abnormal tympanic membranes	5·85	1·89	2·45	NS
Coryza, conjunctivitis	38·68	32·65	7·19	NS

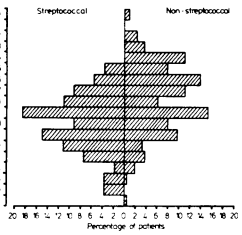
NS = Not significant.

The overall clinical assessment of the likelihood of a streptococcal throat infection was unreliable, being correct in 25/65 (38·5%) for those assessed as streptococcal and in 175/204 (85·5%) for those assessed as non-streptococcal. The mean daily time required to process and interpret the throat cultures was 15 minutes.

Discussion

During the survey 20% of patients presenting with acute pharyngitis were positive for *Strep pyogenes*. The unreliability of clinical assessment in discriminating between streptococcal or non-streptococcal pharyngitis was confirmed[1]; only 38·5% of the cases confirmed bacteriologically had been correctly assessed.

Although the symptom scorecard showed an overall meaningful difference in the individual and mean scores for patients confirmed as culture-positive or culture-negative, it was not sufficiently discriminatory to dispense with taking specimens from the throat for culture, as can be seen from the figure. A score of ≤ 24 reliably indicated only 39/215 (18·1%) of the true negative, while a score of > 30, although indicating approximately half of those true positives, also included 27·4% of the culture-negative patients. On the scorecard we substituted the presence of abnormal tympanic membranes for the results of the white blood cell count for practical reasons. It is unlikely that this substantially prejudiced the assessment using the scorecard.



Percentage distribution of total scores in patients with streptococcal and non-streptococcal pharyngitis.

Of interest is the finding that the presence of coryza was distributed equally between the patients with streptococcal and non-streptococcal infections. Coryza is generally held to be a helpful indicator of viral upper respiratory tract infections.

The simple diagnostic microbiological methods that we used worked well and without mishap. The techniques were readily mastered and no false-negatives were found, suggesting that if laboratory confirmation of the interpretation is required this could be restricted to the culture-positive samples. The selective blood agar method was preferred because it was easy to interpret; it also gave two fewer false-positive results. The interpretation of the selective broth was more critical in its timing and proved more difficult to fit into the daily schedule. It could probably be omitted without seriously jeopardising the investigations, thus saving time required for processing specimens.

Without doubt such bacteriological investigation rationalised the prescribing of antibiotics for acute pharyngitis. The procedure was accepted by the patients, who appreciated the laboratory assessment of their problem. All but one either telephoned or visited the surgery the following day to find out the result of the culture. Among the partners there was an appreciation of both the educational and clinical benefit of the exercise, thus confirming the findings of others.[4]

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Organising a Practice

Giving the best to a trainee

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"What is the structure of the practice and how is it organised?" These are two of the routine questions to be asked when appointing a trainer for a vocational training scheme in general practice. The trainer may then be seen in the context of the setting in which the training will take place. Most training practices are group practices and this article is influenced by that fact. Trainers in small partnerships—that is, two or three doctors—and those who are single-handed have special problems, and the techniques of organisation may well be different from those found in group practice. When preparing to take on a vocational trainee, the trainer must be sure that the existing high standard of organisation takes account of the special needs of training, for only if this is done can the trainer give of his best to the trainee.

Because the system of remuneration in general practice is complex the grant that is given to trainers is often misunderstood—particularly by those who have no experience as principals in general practice under the National Health Service. Apart from remunerating the time and effort that is spent in teaching, the grant also compensates for spending more than the average amount of time on practice organisation before being selected as a trainer. It also allows for those special expenses that will arise when the trainee is in post. This being so, it is not unreasonable for regional postgraduate committees to look for evidence of a high degree of practice organisation when a trainer is appointed.

In considering the question: "How can I improve my practice organisation to give the best to my trainee?" the phrase "emulation, communication, and revelation" will concentrate the mind.

Emulation

Most trainees have nothing with which to compare their training practice: the structure and organisation will be new to them, and they will tend to accept it as the norm. The formative effect that this has on future generations of young principals will be considerable. Trainees tend to be very loyal to their trainers, rather than critical, and are more likely to learn by emulating than by rejecting standards.

The trainee will be influenced by the standard of the practice premises and by the way they are laid out and equipped. Not only will the trainer be observed in this context but so also will the other partners and ancillary staff, and the end result must give an impression of care, interest, and commitment to the patient.

Vocational training is only one phase in the continuum of medical education, so is it unreasonable to ask that during training the young doctor is exposed to attitudes that endorse the concept of continuing education? The allocation of time to carry out the work of the practice must be so organised as to ensure that partners and trainees can attend local postgraduate events and to provide for regular sessions within the practice timetable. No matter how valuable the interchange at coffee time might be each morning, it is no substitute for a regular programme of practice activities and meetings. When the trainee arrives, at least one two-hour session should be planned each week for a formal tutorial, away from the intrusion of the telephone and other distractions. This should be in addition to the existing programme of meetings that would normally be a feature of a well-organised practice. The partnership that foregoes regular business meetings at least once each month does so at its peril. The practice organisation will suffer unless the partners are to keep a tight rein on events. Some of these meetings are valuable experience for a trainee, but others might be so private that the trainee would reasonably be excluded.

Professional people have an implicit duty to review continually the standard of their own work. In a group practice this needs another series of clinical review sessions, which may be held monthly, or, at the very least, quarterly. Trainees and ancillary staff may be usefully deployed to provide groundwork material for these reviews. The example of the repeated questioning of standards, both clinical and administrative, as a form of continuing education is vital in moulding the attitude of the future principal.[1]

Communication

The basis of good group practice is good records. Even the single-handed doctor who maintains that he keeps his records between his ears has no excuse, for the moment he takes on a trainee he becomes a group, and communication becomes essential.

Most family doctors would admit that the state of records in general practice is below standard. The logical starting point for improvement is in teaching practices. This is so, firstly, because of the need for doctors, staff, and trainees to communicate with each other—and this is greatly facilitated by good records; and, secondly, because the example that the trainee takes from the teaching practice should influence standards in the practices that he or she might subsequently join. More and more practices are using typewritten letters when referring patients to hospital. The carbon copies that are kept with the patients' records provide valuable communication between the partners in the practice and the trainee. It is hard to see how in the 1980s teaching practices that still use handwritten letters for referral can justify it as good practice.

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Communication is not only necessary between doctors but also between all staff. This is the concept of the practice team, which if it is to work means that all team members must be able to talk to each other and know what is going on. To achieve this, much organisation is needed to bring together the separate activities of doctors, nurses, health visitors, midwives, social workers, secretaries, receptionists, clerks, and others. The network of practice meetings, whether clinical, business, or training sessions, can include the different groups that make up the practice team—while the occasional whole practice team seminar can only help to cement relationships, define objectives, and promote the understanding of each other's functions in providing for the welfare of the patient. Developing a satisfactory system of meetings in a large practice may well take several years to achieve.[2]

Revelation

It would be possible to work as a bank teller without learning anything about the foreign exchange department, how personal or business loans are made, or how the bank might act as an executor. The same is true for a trainee who, when dealing with the patients in surgery or on home visits might well fail to discover how all the back-up services of the practice contribute to patient care. The well organised practice will reveal itself to the trainee (and, for that matter, to all the staff in the practice). To do this all health professionals and ancillary staff members should participate in teaching the trainees, and be encouraged to discuss their work with the trainees and to answer the trainees' questions. Some in-service training of practice team members may be required if they are to "yield the secrets of the practice" to the trainee.

There are many techniques available to provide such revelations. For example, detailed job descriptions for all staff employed by the partnership would help a trainee to know who should be asked about what. It is also a basic management technique in the proper running of a practice. Many procedures that help the smooth running of the practice are held in the minds of the staff and modified as employees come and go. Such a basic procedure as handling the paper flow in the building may bewilder a trainee. It is easy to prepare a tape recording that describes the paper flow, accompanied by illustrations in a display folder. Not only will the trainee benefit from this but also receptionists, secretaries, or nurses who are joining the staff for the first time.

The foundation of the NHS practice organisation is in the *Statement of Fees and Allowances* (the "Red Book"),[3] whereas the conditions of service for doctors in the Health Service is found in Schedule 1 of the *General Medical and Pharmaceutical Services Regulations*.[4] It is a simple task for a secretary or clerk to keep the "Red Book" up to date with the regular amendments that are sent to all principals. Any trainee should have access to an up-to-date copy of the "Red Book" and a copy of the *Regulations* on the practice premises, together with basic reference books in a practice library. Those of us who teach groups of trainees can testify that this is not always the case—yet having such information available is only a matter of simple organisation plus a relatively small capital outlay.

Project teaching

The technique of project teaching is not as widely practised as it should be. There are many ways of setting about projects, but they may be designed to encourage the trainee to explore in some depth the values and inadequacies of the various aspects of the practice, and some of the outside agencies to which the practice relates. At the same time the project might give an increased understanding of a clinical subject. This example (B Lynch, personal communication) illustrates the point. The trainee was given the following brief:

Consider the care of the chronic sick. For the purpose of this exercise the chronic sick are defined as those patients, whether ambulatory or bed-fast, who require fairly frequent consultations at home, mainly for continuous illness.

Is it possible to identify those patients who fall into the category of chronic sick? How could the source of this information be improved?

To what degree is the concept of the practice team a factor in the care of the chronic sick?

Much of the chronic illness in the practice occurs in the elderly. Would there be any easy way of identifying the number of elderly patients on the practice population graph, and if so, what might this be? Would there also be an easy way of identifying the individual elderly patients in the practice?

Clinical communication between partners in this field is difficult—is it adequate? If not, what proposals would you make for its improvement.

Put forward proposals for the care of the chronic sick in the practice and include comment on: (*a*) clinical implications for the practice; (*b*) the social implications for the patient; (*c*) the practice organisation (including financial) implication of the policy.

It would be helpful to you to compile a reading list of references that might be relevant to this project.

The exercise was conducted over four or five months before being presented to a practice clinical review meeting. A great deal of understanding was achieved resulting from the following: the discovery of several published reports on the chronic sick; conversations with the health visitors and practice nurses concerning the vast amount of work that had been done in identifying and caring for the chronic sick; the discovery of an elderly patients' club that had been founded by one of the partners; an awareness of the inadequacies of general practice records in helping to identify the more deserving of the chronic sick; and the absence of any continuation notes in the patient's home other than those provided by community nursing sisters. Several tutorials with the trainer throughout the project led to a better understanding of the problems with the trainee learning about the contribution of the social worker to the care of the chronic sick. He also discovered that, when proposals were made to alter existing practice, the partners accepted the need for change and were willing to consider policies that could be implemented in the future.

Conclusion

Although this article has only skimmed the surface of the subject, many will raise their hands in horror to say that it is impossible to find the time to organise a practice well enough to give this much effort to a trainee. It is not easy, but it can be and has been done. The answer lies in spending a little money on adequate ancillary staff and a little time on delegating much of the routine organisation to those who are not clinically concerned with patients. The rest is achieved by the careful organisation of the doctor's time to harness the enthusiasm that is an essential prerequisite for a practice that wants to embark on the business of teaching.

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