Use of laboratory services and communication of results to patients in an urban practice: an audit

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SUMMARY. The pattern of investigations in an urban practice of 4200 patients was monitored over an eight-week period. An assessment was made of the characteristics of patients who sought the results of their investigations.

During the study period there were 1522 consultations and 186 investigations were carried out on 155 patients. More females were investigated than males (3.4:1) with most tests among 31–40 year old women. At the end of the study period only 95 patients (61.3%) knew the results of their tests and of 34 abnormal results nine were not relayed to patients. The probability of a patient collecting a result was not influenced by the patient's age or sex, the reason for carrying out the test or the instructions given by the doctor for collection of the result. Abnormal test results were more likely to be collected than normal results.

These findings suggest that many practice systems of relaying information to patients need modifying. Whose responsibility it should be to pass on the results of patients' investigations is discussed.

Introduction

PATIENT investigation is an integral part of any general practitioner's workload. The types of investigation carried out and the reasons for doing them will vary from doctor to doctor and from one practice to another.[1,2]

Previous studies have looked at the utilization of laboratory sources by general practitioners, the influence of patient characteristics on test ordering in general practice[3-5] and the relationship between list size and patient contact in general medical practice.[1] However, few studies have examined whether patients who undergo investigation obtain the results of their tests and whose responsibility it should be to pass on this information. This study was undertaken to examine the use of laboratory services by an urban practice and to assess the efficiency of result collection by patients using the system currently in operation.

Method

The eight-week study was carried out in an urban practice of 4200 patients, mainly in social classes 1 and 2 (Registrar General's classification), with two full-time (one female, one male) and one part-time (female) partners. When an investigation was carried out, the doctor completed a form indicating the name and age of the patient, which tests had been carried out and why, and what instructions the patient had been given about collecting the result, that is, whether to contact the surgery, to make an appointment or to be contacted by the doctor.

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The practice had an established system for dealing with test results and this continued unchanged during the study as the reception staff and patients were unaware that the system was being monitored. When a result was received from the laboratory the name of the patient and whether the result was normal or abnormal was entered into the practice result book by one of the doctors. If the result was abnormal a message was left in the book for the patient to speak to the doctor. When patients contacted the surgery for the results of their tests the receptionist relayed the message written in the book and then deleted the entry.

Although the involvement of the doctors in this study may have introduced some bias it was felt important that accurate information was obtained on the reason for investigation and the instruction given for collection of the result. These details could not be obtained from the result book. It was emphasized that it was the system which was being assessed and not the general practitioners and hopefully this minimized any changes from normal procedure.

Two weeks after the final investigations had been carried out, all entries not deleted in the practice result book were checked against the patients' case records. This established whether a result was communicated during a consultation or by doctor contact rather than by direct patient enquiry.

Results

The study was carried out in November and December 1986 and 1522 patients (890 females and 632 males, 1.4:1) consulted the doctors over the eight-week period. Of these, 155 (10.2%) patients were investigated (120 females and 35 males, 3.4:1) and 186 investigations were carried out (some patients had more than one test). Overall, 5.5% of all male patients consulting over the eight-week period were tested and 13.5% of all females. Investigations were carried out in all age groups with a peak for women aged 31–40 years (Figure 1).

Pattern of investigation

A variety of investigations were carried out, with the doctors using a wide range of the laboratory services at their disposal. Haematology was the most heavily used service, comprising 33.3% of all investigations, followed by bacteriology (22.0%) and biochemistry (18.8%) (Table 1). The full blood count was the most frequently requested test, comprising 23.6% of all the investigations followed by test of mid-stream urine sample (16.1%) and cervical smear (13.9%) (Table 1).

All of the cervical smears and 65% of the full blood counts were requested by the women doctors. The male partner made greater use of tests for monitoring illness than the female partners. He requested 77% of the tests for blood sugar, 75% for drug level, 57% for urea and elecrolytes and 100% for British coagulation ratio.

Collection of results

At the end of the study 95 patients (61.3%) had collected their results or had been contacted by the doctor. In the remaining 60 cases there was no record of the patient receiving the result.

Of the 152 normal results 38.8% were never received by the patients and only 7.2% of the results were relayed by the doctors. Among the 34 abnormal results five had been relayed by

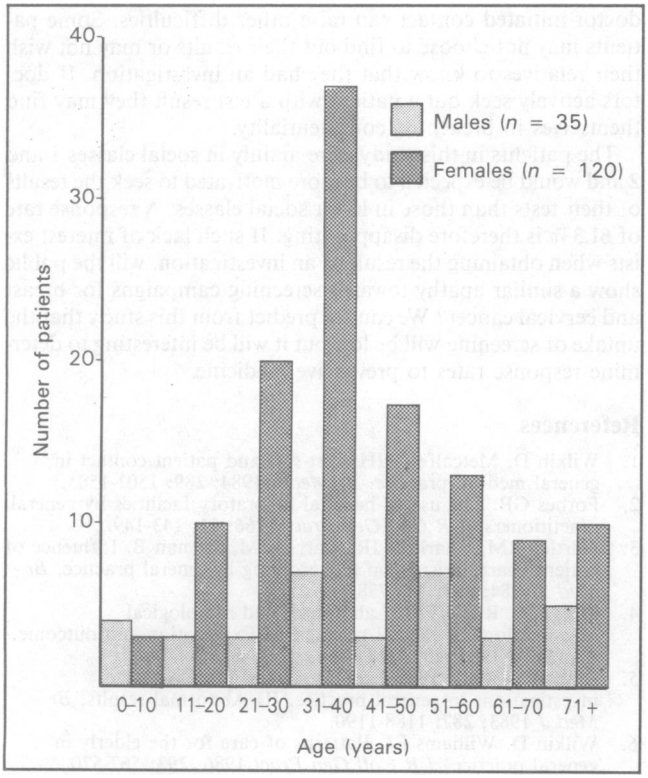

Figure 1. *Age distribution of the 155 patients investigated.*

Table 1. Types of investigation carried out during the study.

	Number (%) of investigations (*n* = 186)
Haematology laboratory	
Full blood count	44 (*23.6*)
Erythrocyte sedimentation rate	9 (*4.8*)
British coagulation ratio	5 (*2.7*)
Monospot	4 (*2.2*)
Total	62 (*33.3*)
Bacteriology laboratory	
Mid-stream urine sample	30 (*16.1*)
Pregnancy test	6 (*3.2*)
Throat swab	3 (*1.6*)
Ear swab	2 (*1.1*)
Total	41 (*22.0*)
Biochemistry laboratory	
Glucose	9 (*4.8*)
Thyroid function	8 (*4.3*)
Urea and electrolytes	7 (*3.8*)
Cholesterol	5 (*2.7*)
Drug level	4 (*2.2*)
Liver function test	2 (*1.1*)
Total	35 (*18.8*)
Pathology department	
Cervical smear	26 (*14.0*)
Radiology department	
Chest X-ray	5 (*2.7*)
X-ray joints	4 (*2.2*)
Barium enema	4 (*2.2*)
Barium meal	2 (*1.1*)
Total	15 (*8.1*)
Other tests[a]	7 (*3.8*)

n = total number of investigations. [a]Electrocardiograph, calcium, testosterone, hormone profile, urine, cortisol, eye swab, stool culture and sensitivity.

the doctors but there were still nine abnormal test results which had not been received by the patients. These were: sugars in known diabetic (two patients), positive pregnancy tests (two), abnormal full blood count with an elevated mean corpuscular volume (one), raised glutamyl transferase level (one), positive monospot (one), infected urine already treated with an appropriate antibiotic (one) and barium meal showing a large hiatus hernia (one). Both pregnant patients attended the antenatal clinic after the study period.

There was no evidence that age or sex of the patient influenced the collection of results with one third of males and one third of females failing to do so.

Number of investigations

Most patients had only one investigation performed during the study period (Table 2). From the figures shown in Table 2 there would appear to be a trend for patients who had more than three investigations to be more likely to collect their results than those who had fewer tests. The figures, however, are skewed towards the lower number of investigations and the apparent trend was not statistically significant using non-parametric tests.

Effect of test outcome

To determine whether the outcome of the test had any effect on patient behaviour a 2 x 2 table of normal and abnormal results versus collected and not collected results was drawn up (Table 3). Although at first glance it would appear that an abnormal result would be more likely to be collected than a normal result a χ^2 value of 1.53 (with Yates correction) failed to reach statistical significance.

Effect of patient instruction

Instructions given to the patient about collection of results at the time of investigation had no influence on subsequent behaviour. Of 147 patients told to contact the surgery only 70 did so. Two patients were told to make an appointment and one did and one did not with a further eight patients choosing to consult the doctor.

The doctors appeared to be reliable in relaying information since they contacted all six patients who were expecting a doctor-initiated call and also felt it appropriate to contact 10 other patients, four of whom had abnormal results.

Table 2. Effect of number of investigations on collection of results by the 155 patients.

Number of investigations per patient	Number (%) of patients	
	Results collected	Results not collected
One	78 (*50.3*)	52 (*33.5*)
Two	13 (*8.4*)	6 (*3.9*)
Three	1 (*0.6*)	1 (*0.6*)
More than three	2 (*1.2*)	1 (*0.6*)

Table 3. Effect of outcome of test on collection of results for 186 investigations.

	Abnormal	Normal	Total
Collected	25	93	118
Not collected	9	59	68
Total	34	152	186

χ^2 = 1.53 with Yates correction, 1 degree of freedom.

More than a third of the investigations (34.9%) were carried out to exclude a diagnosis in the absence of clinical signs. This could also be interpreted as doctor reassurance. Sixteen of the 34 abnormal results (47.1%) were found among the tests carried out to confirm clinical findings. Only two tests were carried out to reassure patients; both had normal results and neither were collected.

Discussion

Patient investigation is an important part of the general practitioner's work. Although comparable figures are not available in the UK, investigation accounts for approximately a quarter of the cost of ambulatory care in the USA.[3]

During the study period more females consulted their general practitioner than males (1.4:1) but the difference for investigations was even greater (3.4:1). This sex difference was most apparent in the reproductive years and may have been exaggerated by the fact that the cervical smears performed in this age group accounted for 21.7% of all investigations among females.

It has been postulated that care of the elderly constitutes a large proportion of the general practitioner's work but in this study patients aged over 60 years were among the least investigated. Similar results have been reported by Wilkin and Williams.[6]

Our findings indicate that approximately 10% of patients consulting their general practitioners during the study period had investigations performed and this figure is comparable with the mean of 12% of patients seen in four general practices reported by Mills and Reilly.[4,5] The tests ordered in our study tended to be simple, inexpensive and ordered singly. The use of the different laboratory facilities is similar to that shown in previous work[5] except for the use of radiology services which was lower in our study.

The doctors showed some variation in the use of the diagnostic services. All of the cervical smears and a large proportion of the full blood counts were requested by the female doctors while the male partner made greater use of tests for monitoring illness. This may reflect the larger cohort of chronic attenders which he has gathered over the years.

It would appear that some patients do not attach a great deal of importance to the collection of results with only 61.3% receiving their results by the end of the study. There are, of course, a number of other factors which may have affected the collection of results, including patients' fear of the result or the assumption that the doctor would contact them if there was any abnormality. The figures may have been elevated by patients collecting the result at another encounter which was not recorded by the doctor. These factors may only apply to a small percentage of patients but they emphasize the importance of efficient record keeping.

The age and sex of the patient, the number of tests carried out, the reason for doing each test and the instructions given to the patient by the doctor for collecting the results would appear to have no bearing on patient behaviour. Thus, systems for relaying information which rely on patient initiative may not be foolproof and in this study nine abnormal test results had not been received by patients. Although none of these abnormalities were life threatening they gave cause for concern and prompted a change in the practice system for dealing with test results.

The doctors passed on information reliably and although it would not be practical to expect clinicians to relay the result of every test, it is not unreasonable for the onus to be placed on the doctor to relay the relatively smaller number of abnormal test results. The system of communication in the study practice has been modified in this way. As well as practical problems a doctor-initiated contact can raise other difficulties. Some patients may not choose to find out their results or may not wish their relatives to know that they had an investigation. If doctors actively seek out a patient with a test result they may find themselves in breach of confidentiality.

The patients in this study were mainly in social classes 1 and 2 and would be expected to be more motivated to seek the results of their tests than those in lower social classes. A response rate of 61.3% is therefore disappointing. If such lack of interest exists when obtaining the result of an investigation, will the public show a similar apathy towards screening campaigns for breast and cervical cancer? We cannot predict from this study that the uptake of screening will be low but it will be interesting to determine response rates to preventive medicine.

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