Can rational prescribing be assessed?

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SUMMARY. The prescribing of a group of young general practitioners was assessed, before and after educational intervention, using five parameters of rational prescribing. The proportion of drugs prescribed by their generic name, and the proportion falling within a basic formulary for general practice increased significantly even though the participating doctors had neither been involved in the compilation of the formulary nor been given a copy of it. Items prescribed by generic name rose from 45 to 74% and the proportions of new and repeat items within the formulary rose by 73 to 83% and 68 to 77% respectively. It appears that discussions about rational prescribing lead to similar changes in prescribing as involvement in the compilation of a formulary.

The notion of an 'essential drugs list' for general practice is described, and three easily applied measures of rational prescribing are suggested: (1) the proportion of patients not given a prescription, (2) the proportion of drugs written in their generic form and (3) the proportion of drugs falling within a general practice 'essential drugs list'.

Introduction

LONG before the imposition of the government's limited list of drugs,[1] general practitioners had attempted not only to reduce the cost of their prescribing but also to make their prescribing more rational. It has, for example, been suggested that each general practitioner or group practice should compile their own formulary.[2,3] Other general practitioners have tried to improve the quality of their prescribing by means of educational projects and audit exercises.[4-8] We have previously described the development of a limited formulary for general practice by general practitioners from separate practices.[9] This formulary contained 137 drugs and was intended to provide adequate and appropriate treatment for 90% of general practice patients.

While it has been possible to measure the cost of general practitioners' prescribing, the proportion of prescriptions that are written generically and the compliance of doctors with a formulary, the assessment of rational prescribing in general practice is more complicated. A possible relationship between prescribing competence and the rate of antibiotic prescribing has been described,[10] but it seems unlikely that such a simple measure could adequately assess the four criteria of rational prescribing: is the drug to be prescribed necessary, effective, safe and economic?[11]

There is evidence that too many drugs are prescribed by general practitioners in an irrational way and in the form of expensive, new and fashionable preparations,[12,13] and it has been claimed that a switch to generic prescribing could yield considerable financial savings.[14] This is by no means certain in view of the present arrangements between the government and the pharmaceutical industry, embodied in the Prescription Pricing Regulation Scheme.

In 1959 the Hinchcliffe Committee recommended that approved (generic) names of drugs should be used on prescriptions in preference to proprietary names as a method of reducing costs,[15] but by 1982 only 19% of prescriptions were for generic preparations.[16] In 1982 the Greenfield report concluded that there remained advantages to be gained from generic prescribing, but that doctors held certain reservations.[17] It appears that these reservations concerning the bioavailability, purity and acceptability of generic drugs have not been resolved.[18]

This paper describes the collection of prescribing data from a group of young general practitioners in Newcastle upon Tyne, before and after educational intervention. Five parameters of prescribing competence were used for assessment, but the participating doctors were not aware of these before the exercise started. As part of the educational intervention the doctors were given information on their relative ratings on four of the parameters. The fifth parameter, the rate of antibiotic prescribing, was only applied after both recording exercises were complete.

Method

The members of the Newcastle Young Practitioners Group were invited to record their prescribing in 150 consecutive general practice consultations during two periods approximately six months apart in 1985, after the imposition of the government's limited list. Those who had already been involved with the authors in the development of a limited formulary for general practice were excluded. For each consultation the doctors were asked to record the age and sex of the patient, the diagnosis and the prescription (if any) given. Repeat prescriptions for regular medication were indicated on the recording sheet by an asterisk.

In the six months between the two recording periods, two of the regular monthly meetings of the young practitioners group were devoted to prescribing. At the first, attended by one of the authors (T.D.v.Z.), the group was given the results of the first recording exercise. The results were produced in the form of league tables based on four arbitrary measures of rational prescribing: (1) the proportion of patients not receiving a prescription, (2) the proportion of items prescribed by their generic name, (3) the proportion of new prescriptions falling within the 137 drugs in our limited formulary for general practice,[9] and (4) the proportion of repeat prescriptions falling within this formulary. The doctors were identified by code letters known only to the individual. There followed a general discussion about these measures, and a more detailed debate about the advantages and disadvantages of generic prescribing. Each member of the group was given a table of the comparative costs of the various makes of commonly prescribed antibiotics.

The second meeting, attended by all three authors and the Professor of Clinical Pharmacology at Newcastle University, was devoted to a discussion of rational prescribing, focussing on the four criteria to be met when prescribing.[11]

The second set of records was analysed in the same way as the first, and subsequently both sets of records were analysed to determine the frequency of antibiotic prescribing.

The participating doctors had not been involved in the development of the limited formulary for general practice, nor were they given copies of the formulary. However, they may have read or heard about the formulary and may not, therefore, have been wholly 'blind'.

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Results

Of the 21 members of the young practitioners group eligible to take part in the study, 12 doctors completed records of their prescribing in both periods. One eligible doctor completed a record in the first recording period but then moved out of the district and the remaining eight had not attended the meeting of the group at which the project was first announced. Of the 12 doctors taking part in the study seven were male and five female, with ages ranging from 29 to 36 years. All the doctors qualified between 1975 and 1979 except for one who qualified in 1972, and all but one received their vocational training in Northumbria. One doctor was on the married woman's retainer scheme; the remainder were principals in general practice in Newcastle upon Tyne.

The results show that the proportion of consultations at which patients received a prescription was the same for the two recording periods (Table 1). The proportion of items prescribed by generic name was significantly higher in the second recording period than in the first (chi-square = 222.5, $P<0.001$), as was the proportion of items which fell within the limited formulary — both newly prescribed items (chi-square = 29.9, $P<0.001$) and repeat prescriptions (chi-square = 9.09, $P<0.01$). As might be expected, repeat prescriptions were more likely to fall outside the formulary than new prescriptions as they reflect the past prescribing behaviour of practices rather than the current behaviour of individual doctors.

The proportion of consultations at which a prescription for an antibiotic was given was the same for the two recording periods, though the range for individual doctors was wide in both periods (Table 1).

In discussion at both meetings on prescribing a number of the participating doctors expressed the view that they had recieved insufficient instruction about prescribing in general practice during their vocational training.

Discussion

It has been shown that general practitioners can change their prescribing habits if they are given information about their own prescribing and an opportunity to discuss this with other general practitioners.[7] In this study the information was provided in the form of league tables. This generated much stimulating and enjoyable debate, without apparently being threatening.

The method of collecting prescribing data also proved useful and not too arduous, though its reliability has not been tested. Comparison with the medical records or collection of duplicate prescriptions for a sample of consultations might have been useful. It should be noted that by recording their prescribing in 150 consecutive consultations most general practitioners will have written approximately 100 prescriptions, as on average practitioners prescribe for two-thirds of their patients.

A further study is required to determine whether the observed changes in prescribing continue. One follow-up study of a group of doctors revealed that most of the effects of intervention had disappeared within two years, though an increase in generic prescribing persisted.[19] The increase in generic prescribing found in that study and in the study described here suggests that doctors' anxieties about generic prescribing can be overcome.[20]

Course organizers and trainers will be interested to note that doctors who have recently graduated from vocational training still make considerable changes in their prescribing habits following educational intervention. Perhaps an even greater emphasis needs to be placed on prescribing during vocational training.

It has hitherto been our belief that doctors' compliance with a formulary is directly proportional to their involvement in its compilation. Our limited formulary of 137 drugs was compiled over one year by 25 mature general practitioners from 19 different practices. These doctors achieved 88% compliance with the formulary when prescribing for patients with newly diagnosed conditions in a two-week trial period.[9]

In the present study the young general practitioners achieved 83% compliance with the formulary when prescribing for newly diagnosed conditions in their second recording period. Yet these doctors had not been involved in the compilation of the formulary, nor had they been given a copy. They were, however, a highly motivated and perhaps atypical group. Furthermore, the reliability of the data from the second recording period, after the doctors had received feedback, may be open to question as the data was self-collated by doctors who now knew roughly what was expected of them.

It appears that discussions about rational prescribing and/or involvement in the compilation of a formulary lead to similar results, and that the list of 137 drugs may approximate to an 'essential drugs list' for general practice. The further development of such a list might, if adopted by the majority of general practitioners, reduce irrational prescribing.

General practitioners interested in studying their prescribing habits need measures of rational prescribing by which to judge themselves. The following parameters may provide a useful framework for assessment: (1) the proportion of patients not given a prescription, (2) the proportion of drugs written in their generic form and (3) the proportion of drugs falling within a general practice 'essential drugs list'.

Table 1. Details of prescribing for the 12 doctors during the recording periods before and after educational intervention.

	First recording period			Second recording period		
	Total	Mean	Range	Total	Mean	Range
No. of consultations	1908	159	135–256	1754	146	100–154
No. (%) of consultations at which prescription given	1087 *(57)*	91 *(57)*	84–151 *(47–71)*	1019 *(58)*	85 *(58)*	52–99 *(50–66)*
No. (%) of consultations at which prescription given for antibiotics	265 *(14)*	22 *(14)*	11–44 *(8–29)*	246 *(14)*	21 *(14)*	9–46 *(6–31)*
No. of items prescribed	1403	117	105–152	1346	112	60–143
No. (%) of items prescribed by generic name	638 *(45)*	53 *(45)*	40–103 *(28–69)*	991 *(74)*	83 *(74)*	52–98 *(56–88)*
No. of new items prescribed	1044	87	60–140	919	77	44–98
No. (%) of new items in formulary	759 *(73)*	63 *(72)*	39–112 *(57–84)*	763 *(83)*	64 *(83)*	35–82 *(78–92)*
No. of repeat items prescribed	359	30	8–54	427	36	12–51
No. (%) of repeat items in formulary	243 *(68)*	20 *(67)*	6–38 *(43–90)*	330 *(77)*	28 *(78)*	9–40 *(69–86)*

Each measure is easily applied and is a reflection, to some extent at least, of one or more of the criteria of rational prescribing.[11] A doctor prescribing to 60% of patients is less likely to issue unnecessary prescriptions than a doctor prescribing to 80% of patients. A doctor who prescribes generically inevitably prescribes more economically than a doctor who prescribes only proprietary drugs. The experienced general practitioners involved in developing the limited formulary chose 137 well-tried, safe and effective drugs. A doctor prescribing mainly from such a list, eschewing 'expensive, new and fashionable preparations' would expect his prescriptions to be economic, safe and effective.

In this study the rate of antibiotic prescribing was unaffected by the educational intervention. However, the doctors had not been informed of their antibiotic prescribing rates during this intervention, and it is possible that such information might have provoked changes. This merits further research.

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INFECTIOUS DISEASES UPDATE

Sterilizing medical instruments

There is renewed interest about the most effective means of sterilizing medical and dental instruments. Dentists for example have recently been advised that boiling should not normally be recommended and that autoclaving is preferred. Hepatitis B, herpes simplex, papilloma and human immunodeficiency viruses (HIV) are generally heat sensitive. However slow viruses (causing some forms of encephalitis), spores and cysts may be more resistant. In conclusion the ideal methods of sterilization remains high pressure steam (autoclaving), or dry heat using purpose built equipment. Items that cannot be heat treated can be soaked in gluteraldehyde but this may be absorbed by rubber or plastic components and cause skin and mucus membrane irritation. The use of sterile disposable equipment, where possible, avoids the problem.

HIV

By the end of April 1987, about 5900 people in the UK were known to be antibody positive to HIV. Most infections in England and Wales were related to homosexual or bisexual practices. Of the 1166 cases in Scotland, however, 659 were related to intravenous drug abuse with a third of these cases being female. Forty-four infected infants, born to antibody positive mothers have been found in Scotland compared with 10 for the rest of the UK.

Food poisoning

The very sharp increase in salmonella and campylobacter food poisoning which occurs in the UK every summer has now begun. Some of this is due to holiday-makers contracting infection abroad but most is due to local consumption of infected meat products, particularly poultry. Studies have suggested that 'factory produced poultry' is usually infected when purchased and therefore preventing illness depends upon sound food preparation. The March edition of *World Health* (published by the World Health Organization) gives some food safety hints.

1. Don't prepare food too far in advance.
2. Don't undercook meat including poultry.
3. Don't store perishable food between 10 and 60°C.
4. Don't 'under reheat' already cooked foods.
5. Don't cook meat that is not fully thawed.
6. Don't allow contamination from raw to cooked foods.

Travel

A case of imported cholera occurred at the beginning of May in a child who had arrived from the Far East. Cholera is usually spread by contaminated water and therefore outbreaks in the UK are unlikely. Where the disease is endemic, principally in the Far East and tropical Africa, travellers need to take care to avoid drinks, ice and so on which may be contaminated. Vaccination is available but it must be remembered that it only gives limited protection.

Life threatening malaria due to *Plasmodium falciparum* is imported into the UK throughout the year usually from Africa. Most benign malaria in the UK is due to *P. vivax* imported from the Indian subcontinent. Illness from this type of infection is usually delayed until the summer months following exposure and therefore can have a long 'incubation' period. Unexplained fever and rigors presenting at this time of year therefore warrant taking a travel history covering the previous 12 months or more.

Further information about these subjects can be obtained from the contributor: Dr E. Walker, Communicable Diseases (Scotland) Unit, Ruchill Hospital, Glasgow G20 9NB (telephone 041-946-7120).