Introducing a drug formulary to general practice — effects on practice prescribing costs

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SUMMARY. A drug formulary comprising 249 preparations of 132 drugs and drug combinations was prepared by the partners in a three-doctor general practice serving more than 5000 patients. No attempt was made to change to generic prescribing nor were repeat prescription drugs altered. Introduction of the formulary in September 1981 was followed by an increase in the proportion of prescriptions containing drugs from the formulary from about 55% to more than 60% for both repeat and non-repeat prescriptions. The proportion of formulary drugs on non-repeat prescriptions reached a maximum of 78% within the first year with the additional influence of information feedback. Over the first year the level of formulary drugs used for both repeat and non-repeat prescribing levelled off at about 62%. Even with these modest changes, when compared with the costs of general practice prescribing in Scotland as a whole, the introduction of the formulary resulted in savings of approximately 10% within the practice for the mean ingredient costs both per patient and per prescription.

Introduction

THE majority of prescribing in the National Health Service occurs in general practice, and it is in this area that the greatest potential for reducing the drugs bill exists. The present structure of general practice is moving towards group practice involving shared patient care, and the participants in such groups may represent wide age differences and variable therapeutic knowledge. These factors, together with the ever increasing number and cost of drugs available, create a need to encourage rational cost-effective prescribing, based on consensus opinion, and continuity in patient care.

Several methods have been suggested for achieving these aims. These include generic prescribing, generic substitution by the pharmacist, the use of cheaper branded alternatives, reduction of the amounts prescribed and even consideration of whether a prescription is justified. These suggestions were put forward in the Greenfield report of 1983[1] which recommended that formularies be developed on a local basis. Improved education and increased awareness of prescribing habits have also been suggested as ways of facilitating prescribing audit.[2,3]

Throughout the country several hospitals have introduced formularies,[4] and experience has shown that an essential feature is active involvement of the prescriber in their development and revision.

During 1980, the members of a three-doctor group practice in Tayside became aware of the need to rationalize their prescribing and reduce drug costs. There was a wide age difference between the members of the practice, and discussion revealed considerable differences in their pharmacological knowledge and hence in their range of preferred drugs. In addition, the wide range of available drugs and the introduction of new preparations encouraged the prescription of a wide range of different medicines. With the knowledge of the success of the Ninewells Hospital formulary in Dundee,[5] the group approached the Medicines Evaluation and Monitoring Group at the hospital for assistance in developing and monitoring a practice prescribing policy.

Method

Preparing the formulary

The doctors in the practice each examined several groups of drugs, for example topical steroid preparations, beta-blocking drugs and non-steroidal anti-inflammatory preparations, and compiled a restricted list similar in style and format to the Ninewells Hospital formulary. The content of the list was discussed by the doctors at evening meetings between June and December 1980, and a final list agreed based on consensus opinion and consideration of cost. A copy of the draft formulary was submitted to the Medicines Evaluation and Monitoring Group in December 1980 for examination and comment. In February 1981, the draft formulary was returned to the practice for further amendment, and in August 1981, the final document was supplied to the practice. The formulary consisted of a list of preparations set out in a classification similar to that of the *British national formulary,* and was introduced into use in September 1981.

Analysis of prescribing

Original prescriptions, available for one month in every four from the Prescription Pricing Division, Edinburgh, were used to assess patterns of prescribing prior to development and introduction of the formulary. For each of the doctors involved, prescriptions were obtained for the available months (February, June and October) from June 1980 to the first available month (October 1981) after the introduction of the formulary. During the subsequent 14 months, prescribing habits were monitored using duplicate prescription pads, on which repeat prescribing was identified.[6]

Prescribing costs for the available months (February, June and October) for the practice and for general practice prescribing in Scotland as a whole, from June 1978 to June 1984 inclusive were used to analyse the pre- and post-formulary costs. During the period June to October 1981 inclusive, active discussion and implementation of the formulary was in progress. Consequently figures available for these months were omitted from the analyses. After the formulary was introduced monthly prescribing statistics were sent to each doctor between November 1981 and March 1982 inclusive.

During the study no attempt was made to change to generic prescribing. If one prescriber preferred, say, Inderal to propranolol then this was permissable in the formulary. There was

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also no attempt to substitute formulary drugs on repeat prescriptions as it was felt that patients who were adequately controlled on long-term therapy should be left alone. For the purposes of this study a repeat prescription has been defined as any third or subsequent prescription of the same drug issued consecutively for the same episode of illness. It thus includes drugs repeated at consultation as well as those issued on request by a patient.

Comparisons between groups were assessed using the Wilcoxon rank sum test. A P value of less than 0.05 was considered to be significant.

Results

There were 5375 patients on the practice list before this study and 5430 at the end of it, an increase of 1%. The formulary, comprising 249 preparations of 132 drugs and drug combinations covering all aspects of general practice prescribing, was introduced in September 1981. During the study period, repeat prescribing as defined above accounted for 66% of the total prescribing.

The mean number of prescribed items per month per 100 patients was 48.9 for the practice prior to the introduction of the formulary, and 49.3 after. This difference was not significant. The comparable figures for Scotland, 52.7 and 55.0, were also not significantly different.

During the first month of formulary use (September 1981), 74% of prescriptions for non-repeat drugs were for formulary items, compared with 59% for repeat items, but this level was not maintained in the second month. However, following the introduction of active feedback of information in the third month (November 1981) the number of non-repeat and repeat prescriptions for formulary items rose to a peak of 78% and 66% respectively in the sixth month. This coincided with the final information package given to the precribers and the proportion of prescriptions for formulary items subsequently fell, but overall remained higher than pre-formulary levels after one-year of formulary use.

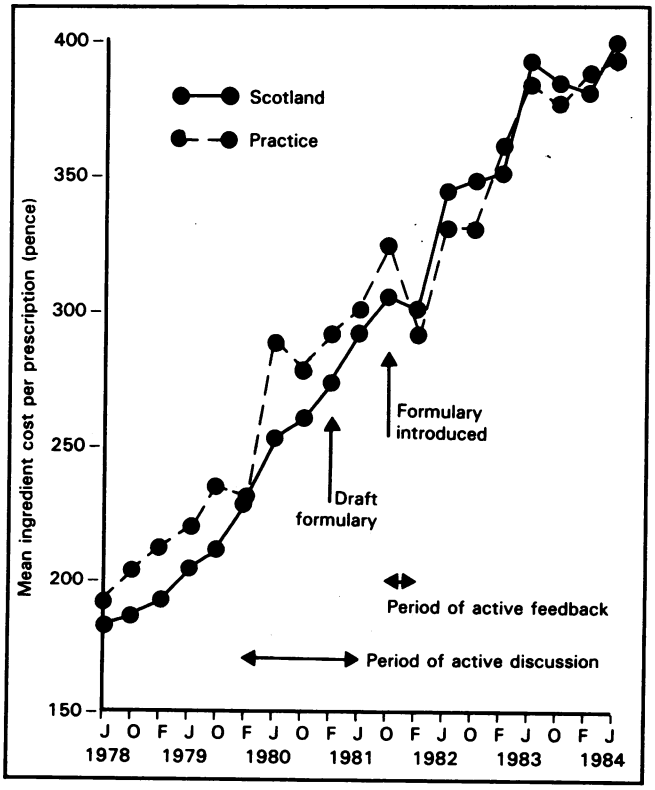

Figure 1. *Mean ingredient cost per prescription for Scotland as a whole and for a Tayside practice (J = June, O = October, F = February).*

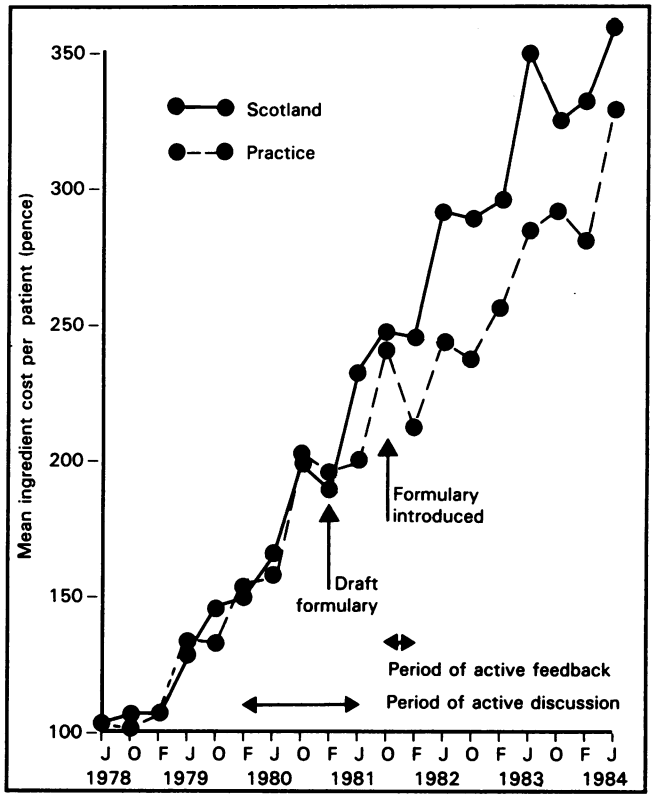

Figure 2. *Mean ingredient cost per patient for Scotland as a whole and for a Tayside practice (J = June, O = October, F = February).*

Mean ingredient cost per prescription

Figure 1 shows the rise in mean ingredient cost (in pence) per prescription between June 1978 and June 1984 for the practice and Scotland in the months where data were available (February, June and October of each year). From June 1978 to February 1981 the cost per prescription for the practice rose by 54%, and the cost for Scotland by 48%. After introduction of the formulary costs still continued to rise. In June 1984, the cost for the practice had risen by 104% of the June 1978 cost, whereas the cost for Scotland had risen by 117%. Before the formulary was introduced the practice prescribing costs were consistently higher than those for Scotland as a whole. Once the formulary was established practice costs fell compared with pre-formulary costs, and generally became lower than those for Scotland. The median reduction in costs relative to Scotland as a whole was 10% after the formulary had been introduced (95% confidence interval 5–12%, Wilcoxon sum rank test).

Mean ingredient cost per patient

Figure 2 shows the rise in mean ingredient cost (in pence) per patient between June 1978 and June 1984 for the practice and for Scotland in the months where data were available (February, June and October of each year). Before the introduction of the formulary the cost per patient was similar for the practice and for Scotland and both were rising but once the formulary was introduced the costs for the practice were consistently lower than those for Scotland. The median reduction in costs relative to Scotland as a whole was 11% (95% confidence interval 8–14%, Wilcoxon sum rank test).

Discussion

Recent studies have shown that it is possible to introduce prescribing policies into general practice,[7,8] and that compliance with such policies is dependent on active involvement of the prescribers concerned.[7-9] Regular feedback of prescribing information helps to maintain interest and awareness of prescribing habits and encourages the desire to rationalize prescribing.[9,10] There is no difference in performance when prescribing statistics are accompanied by comments.[10]

In this study of the effect of introducing a drug formulary on the practice drug bill, although the rate of prescribing was unchanged, savings of up to 10–11% on pre-formulary levels relative to Scotland as a whole have been demonstrated in both cost per person and per item: it would appear likely that this was related to the use of formulary drugs for newly-initated prescribing. A more vigorous attempt to change repeat prescribing and increase generic prescribing might possibly reduce the overall prescribing costs still further.

The interesting feature of this study is the maintenance of change over two years following the introduction of the formulary. In the light of evidence from feedback studies where maintenance of change is rare,[11] commitment to the practice formulary, together with involvement in its construction, may be the key to the maintenance of change observed in this study.

It is inevitable that prescribing costs will rise, largely owing to inflation and the introduction of new forms of treatment. The aims of introducing a formulary are to ensure drugs are used to the best advantage by facilitating drug selection, allowing prescribers to become more familiar with their range of preferred drugs, and to reduce costs. It may also serve as a basis for postgraduate guidance for trainees in general practice. A degree of concordance between members of a group practice is also desirable in view of the current trend towards shared patient care.

If the range of drugs in the practice formulary prepared in 1981 are compared with the government 'limited list' introduced in April 1984 it can be seen that the doctors in this practice had already agreed to restrict the majority of their prescribing even more stringently than the subsequent government requirement. For example, in the case of analgesics there were only six preparations on the practice formulary compared with 27 on the limited list. The practice doctors though still had freedom to prescribe outside the formulary. It is also interesting that their drug selections lay within the subsequent government guidelines. It is to be hoped that the movement towards general practice formularies with their expected effect on prescribing and its costs may prevent further government intervention.

It is concluded that a restricted prescribing policy can be introduced successfully into a general practice, and has the potential for producing financial savings. However, such policies must be flexible, agreed by consesus among the prescribers concerned, and allowances must be made for non-formulary drugs to be used, should the need arise.

References

1. Informal Working Group on Effective Prescribing. *Report to the Secretary of State for Social Services (Greenfield Report).* London: Department of Health and Social Security, 1983.
2. Herxheimer A. Educating doctors to use drugs well. *Br J Clin Pharmacol* 1976; **3**: 111-112.
3. Smith A, Walker JH, Rawlins MD. Clinical pharmacology clinics in general practice. *Br Med J* 1977; **2**: 169-170.
4. Middlebrook MJ. The use of hospital formularies in the UK. *Br J Pharm Pract* 1979; **1**: 12-25.
5. Bateson MC, Crooks J, Hamley JG, *et al.* Experience with a hospital formulary. *Health Bull (Edinb)* 1981; **39**: 45-50.
6. Hamley JG, Brown SV, Crooks J, *et al.* Duplicate prescriptions: an aid to research and review. *J R Coll Gen Pract* 1981; **31**: 648-650.
7. Harding JM, Modell M, Freudenberg S, *et al.* Prescribing: the power to set limits. *Br Med J* 1985; **290**: 450-453.
8. Grant GB, Gregory DA, van Zwanenberg TD. Development of a limited formulary for general practice. *Lancet* 1985; **1**: 1030-1032.
9. Harris CM, Jarman B, Woodman E, *et al. Prescribing — a suitable case for treatment. Occasional paper 24.* London: Royal College of General Practitioners, 1984.
10. Hamley JG, Brown SV, Crooks J, *et al.* Prescribing in general practice and the provision of drug information. *J R Coll Gen Pract* 1981; **31**: 654-660.
11. Harris CM, Fry J, Jarman B, Woodman E. Prescribing — a case for prolonged treatment. *J R Coll Gen Pract* 1985; **35**: 284-287.

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