Systematic review and clinical governance in repeat prescribing in general practice

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The aim of this study was to improve clinical management through rationalization of repeat prescribing in an inner-city practice with a high percentage of older adults with extensive comorbidity through systematic review and cost containment. Outcome measures were based on an analysis of PACT data for level and cost of prescribing before and after the systematic reviews, reported patient and staff satisfaction with changes and the identification of drug interactions. The formalization of a 28-day prescribing cycle and systematic review every 6 months was almost universally acceptable to patients and staff. The systematic review led to a decrease in prescribing costs of 12% over 2 years. The number and cost of wound dressings decreased by almost 50%. The prescribing of inappropriate medications, over-the-counter drugs, benzodiazepines and combinations of drugs that interacted was reduced. The study demonstrates that monitoring and rationalization of repeat prescribing can reduce costs and improve quality of care. In addition, increased surveillance on the part of the reception staff improved communication both between members of staff and between members of staff and patients. This led to increased confidence in repeat prescribing among all staff.

Key words: clinical governance; medical management; systematic review

Introduction

Drugs are a major therapeutic tool for the physician and general practitioner, with prescribing accounting for two-thirds of general practice costs and one-sixth of the NHS budget. Yet the importance of the pharmacogenetic disposition of individual patients to different drug groups, their pharmacokinetic profiles and side-effects, and the interactions of drugs is often neglected during undergraduate and continuing medical education (Straand and Rokstad, 1997). This has implications for quality and appropriateness with regard to good practice, particularly in situations (e.g., the care of older patients) where polypharmacy is commonplace and unavoidable.

Bearing these quality issues in mind, a number of health authorities have piloted projects in which community pharmacists, with their specialist knowledge of drug profiles, work with general practitioners (Mason, 1996; Himmel *et al.*, 1997; Nixon, 1998) and their clinical governance leads to improve clinical management and limit costs. Where evaluation has taken place, it has been mainly in terms of comparisons of current and historic prescribing data, and has not addressed cost-effectiveness (Hughes *et al.*, 1999), efficacy, quality (Howie *et al.*, 1997) or patient acceptability. Bradley *et al.* (1997) have suggested that there may be a conflict of interest if pharmacists and general practitioners are brought together to contain prescribing costs, possibly to the detriment of the patient.

We report here, in terms of both quality and

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cost-effectiveness of prescribing, the evaluation of a review system aimed at rationalizing repeat prescribing in a way that both improved clinical management of patients by initiating regular review, and was acceptable to staff, doctors and patients.

Methods

The study practice had a high percentage of older adults, with extensive comorbidity and polypharmacy. In addition, many of the patients exhibited high levels of stress associated with unemployment and single parenting. This practice is typical of small urban practices with a similar practice profile. In March 1996, when new doctors took over the practice, an opportunity was provided to formalize repeat-prescribing procedures and reduce the high levels of benzodiazepines, slimming preparations, wound dressings, fortified feeds and inappropriate medication prescribed.

The aim of the study was to introduce systematic review of all repeat prescribing in order to improve concordance (through patient awareness of their diagnosis and the role of medication in their continuing health), to substitute generic products where appropriate, to institute a 28-day cycle of repeat prescriptions as the norm (with 56 days in cases where a 28-day cycle might cause financial hardship), to reduce the level of prescribing of benzodiazepines, slimming preparations and drugs whose therapeutic value is unproven, to reduce the prescribing of over-the-counter medication, to assess the levels of patient and staff satisfaction with the changes, to formalize procedures in a rational way that would be acceptable to staff and patients, and to evaluate the intervention in terms of cost and quality.

The main aim of the study was to rationalize repeat medication and improve the clinical management of disease. The method used was to institute a system of 6-monthly repeat medication reviews during which the 28-day repeat prescription cycle was initiated and an assessment of drug interactions was made. An important function of the medication review was to ensure a diagnostic label in the notes for each drug or group of drugs prescribed. Posters were displayed in the practice, informing patients that they would be invited to attend medication reviews where their medication would be changed to a limited cycle. They were also asked to attend a 6-monthly review of their medication regimen and to undergo investigations as appropriate (e.g., thyroid function tests for those on thyroxine, fasting lipids for those on statins). Patient satisfaction was assessed using questionnaires, and the effects on costs and quality of prescribing were assessed from Prescribing Analysis and Cost (PACT) data taken before and after the reviews. A letter was given to each patient who requested a repeat prescription, asking them to make an appointment with the doctor during normal surgery hours for a review of their medication. During this consultation the patient's medical record was updated in order to record all diagnoses. Information was collected on drugs currently being taken, the dosage and frequency and the condition for which the medication had been prescribed. Any changes in medication resulting from the medication review were carefully explained to the patient. Patients were helped to understand the reason why they were prescribed their drugs and the importance of taking them regularly. The patient and doctor reached a mutual agreement (concordance) about which medication should be continued, stopped or started, and the new 28-day cycle of medication was entered on the computer, together with clear instructions on the regimen to be followed. Repeats were authorized for 6 months, after which time patients would attend for further review. Repeat medication that had not been reissued within 6 months was deleted unless it was re-authorized at review.

Where appropriate, patients who were housebound or had difficulty in getting to the surgery were offered a NOMAD scheme in which medication would be delivered to their house labelled for the time of day, the day of the week and the week of the month that it should be taken. The community pharmacist assessed for drug interactions the medication of all patients who had more than six items, taking into account their diagnoses.

All computer-generated repeat medication was identified. A time series of PACT data for the practice was compared with standardized data for the health authority and for England and Wales. Nonparametric statistical tests were applied as appropriate to test the significance of associations (Spearman rank correlation) or differences between groups (Mann–Whitney and Kruskal–Wallis tests).

Table 1 Number of items on repeat prescription categorized by age group (Kruskal–Wallis test: $P < 0.0001$)

	0–20 years ($n = 16$)	20–40 years ($n = 46$)	40–60 years ($n = 116$)	60–80 years ($n = 290$)	> 80 years ($n = 84$)	Total ($n = 552$)
Median number of items	2	2	3	4	5	3
Range	1–5	1–18	1–19	1–15	1–14	1–19
Percentage with 6 or more items (n)	0% (0)	6.5% (3)	22.4% (26)	25.5% (74)	34.5% (29)	23.9% (132)

Results

There were 577 patients on the post-review repeat-prescribing database, of whom there were 353 women and 195 men (sex was not coded for 29 patients). The age range of those with repeat prescriptions was 2–100 years, with a median age of 69 years in women and 70 years in men. Information on the number of prescription items was available for 557 of the 577 patients. The number of prescription items ranged from 1 to 19, with a median of 3. There was a significant rank correlation between age and number of items (see Table 1) ($r = 0.27$, $P < 0.0001$), but the number of items did not differ significantly according to sex (median 3.0 for women and 4.0 for men) (Mann–Whitney U-test: $P = 0.16$).

The median number of diagnoses was two; 23.3% (31 patients) had no diagnosis recorded on the computer and 1.5% (2 patients) had five or more diagnoses entered. Data on diagnoses were available for all of the 133 patients who had six or more items on repeat prescription. Of these, 76.7% (102 patients) had a diagnosis recorded in their computerized medical record. There was a trend towards an increasing number of items on repeat prescription with increasing number of diagnoses. The percentage of patients with more than eight items rose from 16.1% for those with no recorded diagnosis to 43.2% for those with three or more diagnoses ($P = 0.04$; χ^2 trend test). There was no significant difference in the median number of different diagnoses by sex (Mann–Whitney U-test: $P = 0.60$) or by age ($P = 0.31$).

Drug interactions for the 133 patients with six or more items on repeat prescription were assessed by the community pharmacist (J.P.). It was found that 9% (12 out of 133) of these patients were on medications that interacted. These patients had significantly more items on their prescriptions (median of 10 vs. 7 items; $P = 0.03$) (Table 2). Interactions were restricted to those drug combinations which were classified as potentially hazardous in the *British National Formulary*, and to those which advised appropriate monitoring. The interactions so identified were between angiotensin-converting-enzyme (ACE) inhibitors and diuretics, between low-dose aspirin (75 mg once daily) and non-steroidal anti-inflammatory drugs, and between capozide (an ACE inhibitor with a diuretic) and Sando K (a potassium supplement) which could result in an increased risk of hyperkalaemia.

In total, 16.7% (22 out of 132) of the patients who did not pay for their prescriptions would have liked their medication to be delivered. This group had a significantly greater number of items (median 6.0) than those who did not want it delivered (median 4.0) (Mann–Whitney U-test: $P = 0.001$). A total of 10.7% (18 out of 169) of the

Table 2 Items, diagnoses, age and sex by presence of interactions in patients having more than 6 items on repeat prescription
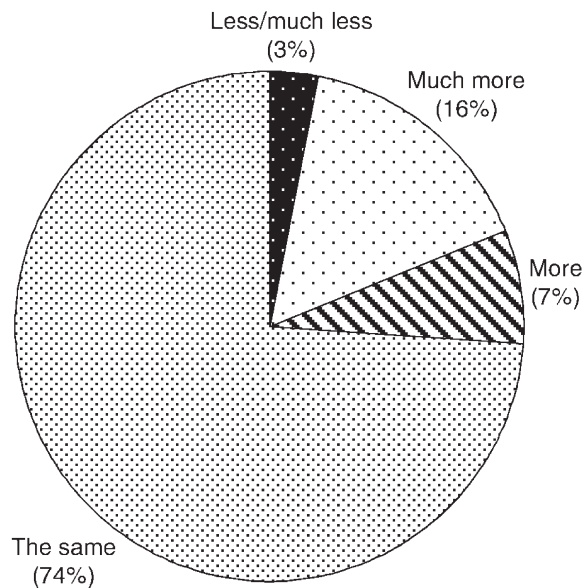
	No interactions ($n = 121$)	Interactions ($n = 12$)	Significance level
Median number of items (range)	7.0 (6–19)	10.0 (6–15)	$P = 0.03$
Median number of diagnoses (range)	2.0 (0–4)	2.5 (0–5)	$P = 0.15$
Median age (years)	71.0	73.0	$P = 0.20$
Male (%)	36.4% ($n = 44$)	41.7% ($n = 5$)	$P = 0.76$

patients would like to have had a NOMAD system of drug delivery. Patients who wished to have this system had a significantly greater number of items (median 5.0) than those who did not wish to have their medication delivered in this way (median 3.0) (Mann–Whitney *U*-test: $P = 0.03$).
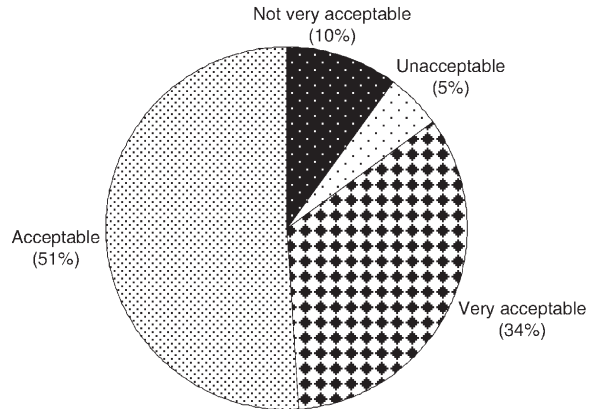
Patient satisfaction

Patient satisfaction was assessed by means of a questionnaire. Patients were asked for their views about the 28-day repeat-prescribing cycle and the information offered at the 6-monthly medication review, as well as the length of the review. The response rate was 34%.

Nearly all of the respondents (97%) reported that they either welcomed the changes or were indifferent to them, and only 3% reported that the changes were unwelcome (see Figure 1). In total, 93.3% of the respondents felt that the time spent on the medication review was satisfactory, and 95.2% felt that the amount of detail it contained was satisfactory. Of the respondents, 85% reported that the 28-day prescribing cycle helped them to take their medication regularly, and only 15% stated that they found the change to a 28-day repeat-prescribing cycle unacceptable, mainly because obtaining a


**Figure 2** Patient satisfaction with the changes to the repeat-prescribing cycle.

repeat prescription every month was inconvenient (see Figure 2).

Costs: PACT data

Generic prescribing in the practice increased steadily from 48% to 79% (see Figure 3) between the last quarter of 1996 (before the intervention) and the first quarter of 1998. The decrease in prescribing costs was sustained over the period of the study (see Figure 4). The dip (see Figure 4) during the second quarter of 1996 is accounted for by the immediate reduction in the quantities of repeat medication prescribed at the time when the new doctors took over and reduced repeat prescribing from what had frequently been 6-monthly (168 days) supplies to monthly (28 days) amounts. Prescribing costs both for the health authority and

Figure 1 Patient satisfaction with the medication review.
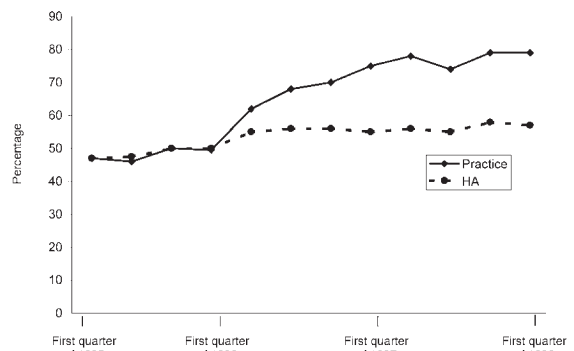

Figure 3 Percentage of generic prescribing in the practice.
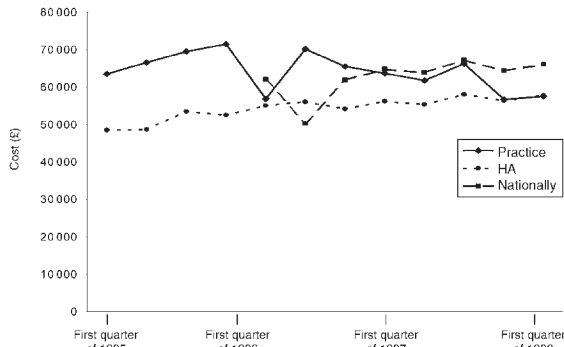
Figure 4 Prescribing costs (standardized from PACT data).

nationally increased over the period in real terms. They decreased in the practice from around 21% above an equivalent practice within its health authority and nationally in 1995, to 12% below a nationally equivalent practice in 1998 (see Figure 5). The number of items prescribed per patient in December 1996 was 26% above the health authority equivalent, and less than 1% above the national equivalent. In September 1997 the number of items prescribed per patient was 12% above the health authority equivalent and 3% below the national equivalent.

There was a reduction in the number of combination drugs prescribed (e.g., capozide prescriptions decreased from 49 in December 1996 to 34 in March 1998). Costs for ACE inhibitors increased from 2.1% of the budget to 3.4%, and costs for calcium-channel blockers increased from 1.2% to 3.4% (210 items in December 1996 and 302 items in March 1998). Very few patients who
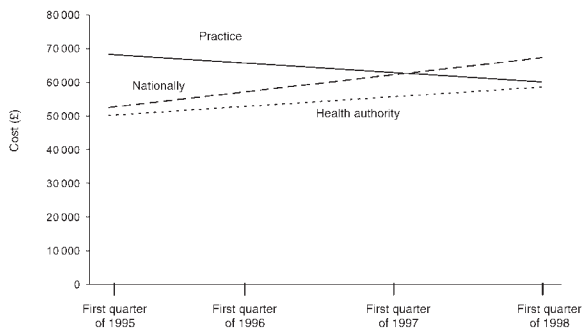
Figure 5 Cost trends for practice, health authority and nationally.

had a diagnosis of heart failure and were hypertensive were on ACE inhibitors before the review. Costs for nutritional supplements decreased by 63%, and costs of dressings were almost halved – from 86 items (£2185) in March 1996 to 37 items (£1181) in March 1998. The number of over-the-counter items on repeat prescription decreased from 146 to 101 between December 1996 and March 1998, and benzodiazepine prescribing was limited to current prescriptions whenever possible. The majority of these over-the-counter prescriptions were for emollients for patients with venous ulcers, and for low-dose aspirin for patients who were considered to be at risk of stroke. Benzodiazepine prescribing was markedly reduced and mostly limited to short defined episodes. However, three elderly female patients found the attention given to their benzodiazepine consumption onerous, and moved to another practice.

The reception staff reported that, as a result of the changes, patients themselves sought to rationalize their repeat prescribing in order to collect their prescribed medication at the same time, rather than in a piecemeal manner as previously. This allowed reception staff a clear overview of prescribing at any one time, and they learned to note drugs requested out of sequence and to inform the doctor.

Discussion

The formalization of a 28-day prescribing cycle and systematic review every 6 months was almost universally acceptable to patients and staff, and has provided an organizational and philosophical policy for health care within the practice. Although the review predated clinical governance, it meant that the practice had in place easily accessible chronic disease registers and repeat-prescribing policies which could be regularly updated with all relevant investigations recorded, and so it was well prepared for clinical governance. In addition, no prescription is issued without an associated diagnosis being noted. The rationalization of medication led to a 12% decrease in prescribing costs as a result of a change to generic prescribing, more appropriate prescribing, restricting nutritional supplements to terminally ill patients, and ceasing to prescribe slimming preparations. There was also an impressive reduction in wound dressings, and with community nurses becoming increasingly respon-

sible for prescribing and holding their own budgets, this situation is likely to improve further.

The response rate to the questionnaire was relatively low (34%), but this was not unexpected as the questionnaires were required to be completed in the practice, and it has been demonstrated that in sociodemographic areas similar to the practice area the response rate to questionnaires is low (McKinnon *et al.*, 1997). During their medication review, some patients expressed a wish to remain on their medication although this was not regarded as appropriate or necessary. Provided that the medication was not considered to be harmful (e.g., a combination drug or a drug whose efficacy was unproven), this wish was often complied with, as it was not the intention to alienate the practice population, although a small minority of patients were upset by the scope of the changes. Particularly problematical are elderly patients who have been maintained for many years on addictive medication (e.g., benzodiazepines) that may adversely affect their physical functioning. The introduction of evidence-based guidelines and clinical governance may support health professionals who seek to encourage patients to relinquish inappropriate prescription-only medication. Similarly, patients who at their medication review expressed a wish to come off medication did so. Some patients who were clearly not taking their medication properly were advised either to take it as directed or to stop taking it and be reviewed in 1 month, when its effect would be evaluated. The NOMAD scheme led to some problems, as a number of patients asked to go on the scheme for their own convenience rather than due to genuine need. Through regular review some patients chose to leave the NOMAD scheme once they had regained their mobility.

The changes in repeat prescribing were initiated to cut costs, improve the quality of repeat prescribing and support clinical governance and the better management of chronic disease. The outcomes of the study reflect its aims.

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