Repeat prescribing: a role for community pharmacists in controlling and monitoring repeat prescriptions

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SUMMARY

Background. *Traditional systems of managing repeat prescribing have been criticised for their lack of clinical and administrative controls.*

Aim. *To compare a community pharmacist-managed repeat prescribing system with established methods of managing repeat prescribing.*

Method. *A randomised controlled intervention study (19 general medical practices, 3074 patients, 62 community pharmacists). Patients on repeat medication were given sufficient three-monthly scripts, endorsed for monthly dispensing, to last until their next clinical review consultation with their general practitioner (GP). The scripts were stored by a pharmacist of the patient's choice. Each monthly dispensing was authorised by the pharmacist, using a standard protocol. The cost of the drugs prescribed and dispensed was calculated. Data on patient outcomes were obtained from pharmacist-generated patient records and GP notes.*

Results. *A total of 12.4% of patients had compliance problems, side-effects, adverse drug reactions, or drug interactions identified by the pharmacist. There were significantly more problems identified in total in the intervention group. The total number of consultations, deaths, and non-elective hospital admissions was the same in both groups. Sixty-six per cent of the study patients did not require their full quota of prescribed drugs, representing 18% of the total prescribed costs (estimated annual drug cost avoidance of £43 per patient).*

Conclusion. *This system of managing repeat prescribing has been demonstrated to be logistically feasible, to identify clinical problems, and to make savings in the drugs bill.*

Keywords: *pharmacist; repeat prescribing; prescribing costs.*

Introduction

GENERAL practice prescribing accounts for 10% of the national United Kingdom National Health Service (NHS) budget and has been widely criticised.[1] Repeat prescribing accounts for approximately 75%[2] of all general practice prescribing, yet current practice is generally acknowledged to provide inadequate control, resulting in overprescribing, drug stockpiling, and infrequent therapy review.[3] This may lead to failure to identify issues such as drug interactions, adverse drug reactions, poor compliance, and inappropriate treatment.

Proposals have been made for increased involvement of the community pharmacist in primary health care, interfacing both with the general practitioner (GP) and directly with the general public.[4-7] A study of Grampian GPs' attitudes towards various extended roles proposed for the community pharmacist[4] supported an assessment of pharmacist-controlled repeat prescribing.

The aim of the study was to evaluate a pharmacist-controlled repeat prescribing system. The research question was, 'what are the implications for patient, community pharmacist, GP, and the NHS?'

Specific objectives were to evaluate changes in patient care with respect to patient compliance; adverse drug events; non-elective hospital admissions, death rate; cost savings from reduced drug wastage; shifts in workload; administrative cost changes; participant (patient, GP, practice manager, community pharmacist) satisfaction.

This paper reports the clinical outcomes for the patient and changes in dispensed drugs. Other outcomes are reported elsewhere.[8,9]

Method

Study design

This was a randomised controlled trial of a new service provided by community pharmacists, to monitor and authorise repeat prescribing and dispensing. The unit of randomisation was the general practice. The mechanism that was used to conduct the study within the current legislation was instalment dispensing. The study was discussed extensively with representatives of the Scottish Office, the Pharmacy Practice Division, The Joint Ethical Committee, the GP subcommittee of the Local Medical Committee, and the Area Pharmaceutical Committee.

Recruitment of professionals

Every medical practice in Grampian (n = 89) was invited to participate in the study. Practices were stratified by location, number of partners, and current duration of repeat prescriptions, and were then randomised to either the control or intervention group using random number tables. The control group continued with their current method of issuing repeat prescriptions, and the intervention group changed a sample of patients to the new system. Nineteen practices were recruited (nine intervention [36 GPs] and 10 controls [35 GPs]).

All pharmacists in Grampian (n = 121) were informed of the study and a list of the intervention group practices was circulated. In rural locations, where there is often only a single pharmacy, pharmacists were specifically asked if they were willing to participate. Pharmacies and practices were visited before the study started. Pharmacists in the catchment area of the interven-

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tion practices were invited to attend one of four meetings with the GPs to refine the study logistics and documentation.

Patient recruitment

All patients on repeat medication, and meeting the study inclusion criteria, were eligible for this study unless they paid for their prescriptions and did not have a prepayment card, required a review period of less than three months, were on extremely high cost items; e.g. cyclosporin, were on oral contraceptives or hormone replacement therapy, were on controlled drugs being taken for a drug dependency problem, were only prescribed surgical items, or were under 16 years of age. Target recruitment was 250 patients per practice. Each day during a 10-week period in summer 1995, the first five patients requesting their repeat medication were recruited. Patients in the control practices were similarly 'flagged'. Exclusion criteria were applied by the researchers at data entry.

The intervention

The intervention lasted for 12 months. Patients were provided with sufficient 'three-monthly' instalment prescriptions to last until a review date, set by the GP (e.g. three, six, or 12 months) according to clinical need. The prescriptions were kept by a pharmacist of the patient's choice and dispensed monthly following a protocol to check whether the items were required, patients were complying, or experiencing symptoms of side-effects, adverse events or drug interactions. Information was recorded on specially designed patient record cards retained by the pharmacist.

Communication with professionals

All GPs and pharmacists were regularly contacted by the research team to identify and resolve problems. Newsletters were circulated to community pharmacists and GPs three times throughout the study period to inform and maintain motivation.

Outcome measures

For the intervention patients, at the point of dispensing, data was recorded by pharmacists on suspected compliance problems, adverse reactions/side-effects/drug interactions, and other symptoms/problems. For all control patients and a sub-sample of the first 100 intervention patients recruited per practice (56% of total), general practice notes were searched for information on the number of consultations and compliance problems, adverse drug reactions, non-elective hospitalisation, and death during study period. Workload limitations prevented the general practice note searches being carried out for all intervention patients. There is no reason why the intervention group subsample would not be representative of the total sample given the recruitment method. These numbers were sufficient to give a study power of greater than 90% to detect differences in outcome percentages of 4% or more with a statistical significance at the 5% level, and for continuous outcomes to detect a difference in mean outcome of one or more.

Data collection, data entry, and analysis

All data were entered onto a Microsoft Access[10] database. As the unit of randomisation was the practice, analysis should strictly be conducted by practice. However, the relatively small number of practices gave low power. Thus the analysis was carried out on the basis of the patient but accounted for the clustering effect of the general practice.

For comparisons between the groups for the data collected from general practice patient notes, data were exported to SPSS.[11] Descriptive analyses were carried out for the binary outcomes by considering the absolute numbers and percentages of the marginal totals; continuous variables were presented in the intervention and control groups in terms of the median and upper and lower quartiles. Regression analyses, adjusted for age and sex, were carried out for the continuous variables. To allow for the possible clustering effect, further regression analyses were carried out with the general practice added in as a random factor nested within the groups. This was modelled using programmes from the statistical software package of Genstat.[12]

Drug cost data

Copies of all the intervention group's study prescription forms were obtained from the Pharmacy Practice Division, Scottish Office Home and Health Department. Drug acquisition costs, excluding professional fees, were calculated based on the Scottish Drug Tariff and Chemist and Druggist price list figures effective at the calendar midpoint of the intervention period. The health economic term for 'reduced spend' is 'cost avoidance', since the change may not result in available money. However, any such changes are reported in this paper using the commonly accepted term 'saving'.

Results

Demography

General practice and patient demography is shown in Table 1. No statistical differences were identified between the two groups.

A total of 1614 patients were recruited to the intervention, and

Table 1. General practice and patient demography.

	Intervention	Control	Total
Variable	n (%)	n (%)	n (%)
Practice factors			
Fundholding			
Yes	3	4	7
No	6	6	12
Location			
Urban	5	5	10
Rural	4	5	9
No. partners			
1	2	2	4
2	3	2	5
3	–	2	2
4	–	–	–
5 or more	4	4	8
Patient factors			
Sex			
Female	549 (60.7)	799 (56.9)	1348 (58.4)
Male	356 (39.3)	605 (43.1)	961 (41.6)
Total	905 (100)	1404 (100)	2309 (100)
Deprivation			
1	98 (19.9)	356 (30.5)	454 (27.3)
2	92 (18.7)	256 (21.9)	348 (21.0)
3	86 (17.4)	162 (13.9)	248 (14.9)
4	56 (11.4)	129 (11.0)	185 (11.1)
5	46 (9.3)	70 (6.0)	116 (7.0)
6	57 (11.6)	70 (6.0)	127 (7.7)
7	58 (11.8)	125 (10.7)	183 (11.0)
Total	493 (100)	1168 (100)	1661 (100)
Age			
Lower quartile	59	52	55
Median quartile	68	65	66
Upper quartile	75	74	74
n	904	1397	2301

1460 control patients were 'flagged'. In all, 1405 control patients' notes were available for follow-up; the remainder of the patients had died or were otherwise unavailable. Overall, the two arms of the study were balanced in terms of deprivation (defined by postcode[13]), age, and sex. Because of the large number of missing postcodes, regression analyses were only adjusted for age and sex to avoid reducing the power of the study.

Pharmacy collected patient care data: intervention group

Sixty-two pharmacies received 'intervention' prescriptions. Potential problems were identified in 196 (12%) patients (Table 2). There was no correlation between the number or type of problem and the sex of the patient.

Comparison between intervention and control groups

Pharmacy data (drug compliance problems, adverse drug reactions, and drug interactions) were added to the information on these outcomes collected from the patient notes for the intervention group. There were 905 complete patient datasets. The data from the control group is based solely on information from 1405 patient notes.

There were more adverse drug reactions, more hospital admissions, and more compliance problems identified in the intervention group. Inspection of the problems identified by the pharmacist, compared with those identified from the patient notes, showed duplication in only three patients. The death rate was the same in each group (58 [3.6%] in the intervention and 55 [3.8%] in the control). There was no difference in the median number of GP visits between the groups, but there was a higher median number of drugs prescribed in the control group (Table 3). When the clustering effect is taken into account, and allowance is made for randomisation by practice, there were only two significant results; more compliance problems were identified in the intervention group and more items were prescribed in the controls.

Table 2. Type and frequency of problems identified by community pharmacists.

Category of problem	Number of problems
Compliance problem	
Late to collect/forgot/not taking	47
Dose taken not the same as dose prescribed	34
Early to collect/taking too much	33
Items not required	24
Miscellaneous (e.g. can't open bottle, can't swallow tablets, tablets not working)	10
Confused	5
Subtotal compliance	153
Adverse drug reactions/side-effects	
Non-steroidal anti-inflammatory drugs	8
Other analgesics	6
Miscellaneous (e.g skin reacion to Transiderm, diarrhoea from omeprazole)	10
Drug interaction	
Prescription interaction	4
OTC interaction with prescribed drugs	2
Subtotal ADR/drug interaction	30
Other problems	
General symptoms (e.g. 'funny turns', nausea, tinnitus)	34
Drug-related issues	15
Prescription problems	9
Miscellaneous	8
Problems related to study	2
Subtotal other problems	68
Total	251

OTC = over-the-counter; ADR = adverse drug reactions.

Individual drug data

Prescriptions were retrieved for 1555 patients (5374 items). The total acquisition cost for all prescribed items was £369 020, for dispensed items it was £302 034, and the total acquisition cost avoidance for non-dispensed items was £66 986 (18.2% of the prescribed ingredient costs). The number of patients who did not require their full prescribed quota of drugs was 1020 (i.e. 65.6% of the population analysed). Average 'saving' per patient not requiring the full prescribed quota of drugs was £65.67 (average annual 'saving' per patient of £43).

Table 4, ordered from high to low 'savings', provides a breakdown by BNF (British National Formulary) group of the total 'savings' achieved.

Discussion

Methodological issues

The recruitment population comprised all eligible patients who currently receive medication on repeat prescription. There is some anecdotal evidence that otherwise eligible patients may have been considered 'unsuitable' by the GP, and therefore excluded. This may have affected the study sample. Patients on a straightforward medication regime would be less likely to prompt pharmacy intervention, thus minimising the apparent 'value added' impact of the system.

Implications of the results

The formal involvement of pharmacists in the repeat prescribing/dispensing process allowed identification of a range of drug-related problems additional to and different from those detected by the GP. It was not possible to collect direct comparison data for the control group because of the 'Hawthorne Effect',[14] but pharmacists do not routinely seek out such problems for patients on repeat medication. Assessing the clinical significance of the problems identified by the pharmacists was outwith the remit of the study; questionnaire feedback indicated that this information was welcomed by GPs.[8]

Patient suitablity for such a repeat system requires consideration. Patients on stable, straightforward medication regimes are the easiest for pharmacists to manage, and the ones for whom GPs are prepared to delegate care. Patients with more complex regimes may require the pharmacist to take greater responsibility, which the GP may not support, yet such patients may benefit most.

It was anticipated that intervention group patients might go to their GP more often than the control group because of the enforced medical review and/or because of increased referrals from pharmacists. In fact, there was no statistical difference in the total number of visits for the intervention group compared with the control group.

There are indications from the study results that there could be significant 'savings' associated with the new system, mostly owing to non-dispensed prescribed medication, but also owing to additional identification of drug-related problems. The full economic significance of this would require a detailed study to consider the specific drugs not dispensed and possible clinical implications. This would have to be balanced against the 'saving' attributable to the non-dispensing.

Implications for future practice

This modified repeat prescribing/dispensing system provides

Table 3. Comparison between intervention and control groups for hospital admissions, compliance problems, adverse drug reactions, GP visits and items prescribed; and the *P*-values for an intervention effect in multiple logistic regression and multiple linear regression when general practice is added as a random factor in a generalised linear mixed model (GLMM) or generalised estimating equations (GEE).

Outcome	Intervention n (%)	Control n (%)	Multiple linear or logistic regression	GLMM or GEE
Hospital admission				
Yes	54 (6.0)	80 (5.70)	P = 0.983	P = 0.856
No	851 (94.0)	1325 (94.3)		
Total	905 (100)	1404 (100)		
Compliance problem				
Yes	86 (9.5)	35 (2.5)	P = 0.0001	P = 0.0001
No	819 (90.5)	1370 (97.5)		
Total	905 (100)	1405 (100)		
Adverse drug reactions				
Yes	75 (8.3)	94 (6.7)	P = 0.259	P = 0.291
No	830 (91.7)	1311 (93.3)		
Total	905 (100)	1405 (100)		
GP visits (*n*)				
Lower quartile	2	2	P = 0.028	P = 0.276
Median quartile	4	4		
Upper quartile	7	8		
Total items prescribed (*n*)				
Lower quartile	1	1	P = 0.0001	P = 0.003
Median quartile	2	3		
Upper quartile	4	4		

Table 4. Breakdown of drug costs by British National Formulary (BNF) group.

BNF Group	Non-dispensed cost	Prescribed cost	Dispensed cost
Gastrointestinal	£15 108.97	£76 831.61	£61 722.65
Respiratory	£12 670.78	£75 568.05	£62 897.27
Cardiovascular	£10 202.35	£87 159.00	£76 956.65
Endocrine	£7508.99	£26 968.19	£19 459.21
Skin	£6490.49	£22 317.48	£15 824.86
Musculoskeletal	£6022.53	£31 945.38	£25 922.85
CNS	£4982.34	£28 790.84	£23 808.48
Gynaecology	£941.21	£3809.10	£2867.88
ENT	£879.89	£2501.66	£1621.77
Eye	£754.04	£4408.32	£3654.28
Blood	£734.48	£4132.44	£3351.88
Infections	£379.10	£1562.09	£1182.99
Malignant disease	£153.14	£2674.39	£2521.25
Urinary and stoma appliances	£154.72	£241.27	£86.56

CNS = central nervous system; ENT = ear, nose, and throat

patient benefit and reduces drug costs. It is recommended that it should be used more widely, either through nationally or locally negotiated contracts. In theory, drug cost 'savings' could be used to finance the service. White Papers[7,15] have highlighted the potential for the community pharmacy to become integrated within the primary health care team. Some of the most recent White Papers[16,17] propose a mechanism for integration through local health care cooperatives (Scotland) and primary care groups (England). However, robust ways of remunerating new pharmaceutical roles still require development.

In summary, the study system evolved as a way of allowing pharmacists to provide an enhanced repeat prescribing system under the restrictions of the current system. The study has demonstrated the feasibility of the principle but does not recommend that the mechanism, *per se*, be adopted. A robust system to deliver the service now needs to be developed, which combines the patient care elements of the study system with a mechanism for reimbursement and remuneration of pharmacists.

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