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Peer Comparison Feedback to Achieve Rational and Economical Drug Therapy in General Practice: A Controlled Intervention Study

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The aim of the study was to describe and evaluate a controlled intervention to achieve more rational and economical drug therapy in general practice. The strategy was based on peer comparison feedback and encouragement of local peer group discussions. Seven districts comprising 53, and 6 districts comprising 55 eligible practices constituted the intervention and control groups respectively. The process was evaluated by questionnaires to the GPs. 88% found the feedback diagrams relevant, and 74% expressed a wish for information about prescribing of particular drugs. The outcome evaluation was based on computerized registration of prescriptions. During the study period of 6 months the median costs per prescription increased significantly in the control group, whereas there was no statistically significant change in the intervention group. There were no significant effects on the prescribed amounts.

Key words: general practice, prescriptions, quality assurance, cost containment, intervention.

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Drug therapy is one of the most widely used methods of treatment in general practice. Several attempts have been made to improve the prescribing practices of general practitioners (GPs) with focus on quality or costs (1). Reductions in the amounts of prescriptions or costs per prescription have frequently been interpreted as improvements (2–4). For selected types of drugs such as certain antibiotics and hypnotics/sedatives one may speak of a professional consensus that improvement means reduced use (5–8).

By agreement between the General Practitioners' Association and the Public Health Insurance, drug committees have been set up in the Danish counties to achieve rational and economical drug therapy in general practice. In 1989, the drug committee in Frederiksborg County (FC) decided on an intervention strategy that was based on feedback to GPs about their prescribing patterns and encouragement of local peer group discussions according to the principles of medical audit (9, 10). The aim of the present study was to describe and evaluate the process and outcomes of the intervention. The questions were:

- Are GPs interested in peer comparison feedback?
- Does feedback lead to changes in the prescribed amounts and/or costs per prescription?

MATERIAL AND METHODS

Material

The primary health care services in FC were divided geographically into 14 practice districts. Since the beginning of November 1989, all the pharmacies in 13 of the 14 districts have provided computerized information to the Public Health Insurance about the prescriptions from each general practice.

All general practices in these 13 districts were considered eligible for the study, provided that they were not started, fused, separated, or sold during the study period. Thus, 108 (88%) of the 123 practices in FC were eligible. These practices had in total

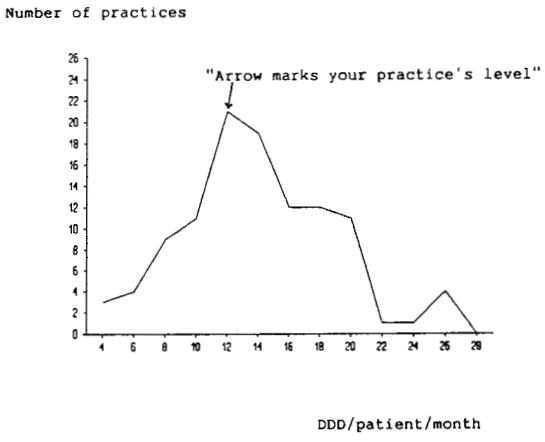

Figure 1. Practice distribution by prescribing levels. Total prescribing in defined daily dose (DDD) per patient per month. November 1989.

233 264 patients aged 16 years or older on the list (October 1989).

Because of the intention to facilitate local peer discussions, the intervention was directed towards either none or all of the practices in a particular district. The districts were selected, but not by randomization, for intervention or control to obtain approximately the same number of practices in the two groups, and districts with the same composition of the population represented in each group. The selection was made before the registration started.

Seven districts comprising 53 eligible practices with 103 GPs and 119135 patients on the list were selected for the intervention group, and 6 districts with 55 eligible practices and 114 129 patients constituted the control group.

Registration of prescriptions

In Denmark practically all prescription medicine except hypnotics and sedatives is partly paid by the Public Health Insurance by means of reimbursement to the pharmacy for the part not paid by the patient. This reimbursement is based on the pharmacy's reporting to the Public Health Insurance. The computerized reporting allows identification of the practice that prescribed the medicine. For practices comprising more than one GP, it is not possible to distinguish between the prescriptions from different GPs. The prescribed amounts are calculated in 'defined daily doses' (DDD), and costs are calculated in Danish kroner (Dkr). The DDD is a technical measure defined for each drug by the Nordic Council on Medicines in collaboration with the WHO Drug Utilization Research Group, and thus it allows international comparisons (11).

Danish inhabitants aged 16 years and over can choose to be on a particular practice's list (Group I) or not (Group II). In the latter case they will have to pay a certain consultation fee themselves. More than 95% of the inhabitants of FC are in Group I.

In this study the prescription data were provided by the computerized information from the pharmacies to the Public Health Insurance in FC. The data were checked by comparing the pharmacy's computerized information with prescription copies from two randomly selected practices. There was complete agreement for more than 95% of the checked prescriptions. Because of lack of copies it was not possible to check about 15% of the prescriptions.

The Public Health Insurance also provided data about the list size of the individual practices in FC, so that the prescribed amounts could be related to the number of patients on the list. Thus, for each practice the numerator related to the prescriptions from the whole practice, and the denominator was the total number of patients on the practice list.

Intervention

The intervention started during the last three days of November 1989, when each GP in the intervention group received peer comparison diagrams showing the total prescribed amounts of medicine per patient (Fig. 1) and the costs per prescription (Fig. 2). The GPs also received a questionnaire asking about views on the diagrams and wishes for information about prescribing patterns for particular drugs. This questionnaire should have allowed each individual

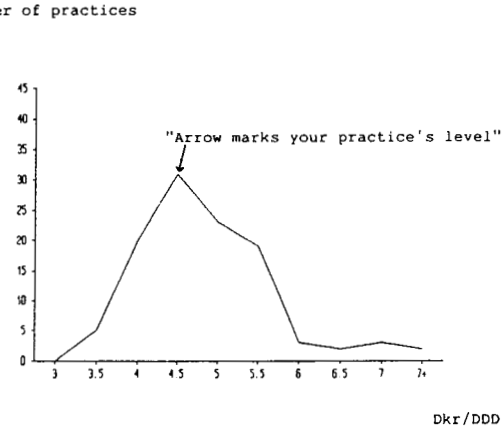

Figure 2. Practice distribution by prescription costs in Danish kroner (Dkr) per defined daily dose (DDD). November 1989.

Table I. *Total amounts of prescribed defined daily dose (DDD) per practice. Median (with 95% confidence interval), 2.5 percentile, and 97.5 percentile. Unit: Prescribed DDD/patient/month.*

Group	Percentile		97.5
	2.5	Median (conf.int.)	
Intervention group			
- Baseline	4.3	12.1 (9.6–15.6)	24.9
- Intervention	3.5	12.7 (9.7–15.3)	26.1
- Interv. - Base	−3.3	0.5 (− 0.3– 1.2)	5.1
Control group			
- Baseline	4.6	13.0 (11.9–13.9)	24.7
- Intervention	4.4	13.0 (11.8–14.8)	25.4
- Interv. - Base	−3.7	0.1 (− 0.3– 0.4)	5.8

GP to obtain information according to the expressed wishes and consequently it was not anonymous.

The GPs received peer comparison diagrams again at the end of January and March 1990. Some diagrams related to the total amount of prescriptions, whereas others referred to prescriptions of selected drug types.

None of the diagrams were followed by comments or recommendations. The GPs were encouraged to join local peer discussions on their patterns of prescribing to assess the quality themselves according to the principles of medical audit.

Evaluation

It was planned to evaluate the intervention by the end of May 1990 to provide the background for the county council's decision on whether the intervention should continue and eventually include all the districts in the county.

The assessment of the GPs' interest in peer comparison feedback was based on the questionnaires. The outcome evaluation was based on comparing the prescribed amounts and costs per prescription during the intervention period December 1989–May 1990 with those of November 1989, which was regarded as baseline. The Wilcoxon signed rank test was used (12), significance level 5%.

Ethics

The project was approved by the Cooperative Committee of the General Practitioners' Association and the county council in FC. All the GPs in FC were informed about the project, and the data were treated confidentially. No patient data were registered.

RESULTS

Sixty-nine GPs in the intervention group (67%) answered the questionnaire. No reminders were sent. Sixty-six (96%) of the responders found the diagrams easy to understand, and 61 (88%) considered them relevant. Fifty-one (74%) expressed wishes for information about patterns of prescribing for particular drugs.

Table I shows the prescribed amounts per practice. There were no statistically significant differences between the intervention period and baseline amounts in either of the two groups.

Table II shows the prescription costs per practice in Dkr/DDD. In the intervention group there was no statistically significant difference between intervention period and baseline costs. In the control group, however, the costs per prescription during the intervention period were significantly higher than their baseline level ($p < 0.001$). The median difference was 0.16 Dkr/DDD with a 95% confidence interval between 0.05 and 0.21 Dkr/DDD. This difference is equal to 3.4% of the median costs per prescription at the baseline level. On the basis of the impressions from the preliminary figures the county council unequivocally decided to continue financing the intervention and extend it to all districts.

There were no indications that the feedback diagrams had greater effects on high-prescribing GPs, defined as those who in the baseline period were

Table II. *Total prescription costs per practice in Danish kroner (Dkr) per defined daily dose (DDD). Median (with 95% confidence interval), 2.5 percentile, and 97.5 percentile. Unit: Dkr/DDD.*

Group	Percentile		97.5
	2.5	Median (conf.int.)	
Intervention group			
- Baseline	3.29	4.28 (4.16–4.71)	6.55
- Intervention	3.17	4.56 (4.14–4.88)	6.00
- Interv. - Base	−0.55	0.10 (−0.04–0.19)	0.87
Control group			
- Baseline	3.48	4.65 (4.28–4.86)	6.77
- Intervention	3.54	4.88 (4.43–5.10)	6.59
- Interv. - Base	−0.66	0.16 (0.05–0.21)	0.83

above the 75 percentile, neither regarding the prescribed amounts nor costs per prescription.

No subgroup analyses were made of the prescribing patterns of only those GPs who positively expressed their interest in the peer comparison feedback.

DISCUSSION

The study has shown that most GPs were interested in peer comparison feedback on prescribing patterns. Even if those GPs who did not answer the questionnaires are regarded as not interested, more than half of the 103 GPs in the intervention group replied positively that they found the diagrams relevant. The fact that the questionnaires were not anonymous may have artifically affected the answers in a positive direction, although the GPs were assured that their answers would be treated confidentially. The expressed interest in the diagrams was rendered probable by the fact that 74% of the replies included expressed wishes for information concerning particular drugs.

The validity of the outcome evaluation depends primarily on the validity of the reported prescription data from pharmacies. It was not possible to obtain a complete sample of prescription copies to check these data. The figures concerning prescribed amounts per patient represented an overestimation, because the numerator reflected all prescriptions from the practice while the denominator only referred to the number of patients on the list. However, this applied to both the intervention and the control group and to both the baseline and the intervention period.

Regarding the results depicted in Table II, the actual difference in prescription cost development between the intervention and control groups was so small that firm conclusions should be avoided. However, the county council took action on the preliminary figures, interpreting them as an indication that the intervention had succeeded in keeping costs at a fixed level despite the concurrent introduction of new and more expensive drugs and the increase in drug price levels.

Though the study showed no effects on the prescribed amounts per practice, it cannot be excluded that a longer intervention period might have provided some effects on prescription amounts. Other findings have indicated that about 9 months of feedback intervention is necessary to get a statistically significant effect on costs per prescription, whereas this is still not enough to affect prescription numbers (3). The overall conclusions from experimental studies on changing doctors' prescribing patterns are that mailed material has little or no effect in itself, while goal-directed educational outreach conducted personally by doctors or pharmacists may lead to changes (1, 4, 6, 13), although success is not guaranteed even in the most well performed studies (8).

Recent findings from another medical speciality suggest that practice guidelines may not meet the ultimate objective of quality assurance as regards changes in doctor behaviour within a reasonable time, "unless they are embedded in a broader program that addresses the need for translation and implementation of the guidelines locally" (14). Local peer groups are probably an appropriate forum for this process in general practice. Therefore, the establishment and work of such groups should be further encouraged. Peer comparison feedback – on prescription patterns as well as on other practice activities – should be regarded as a tool for intervention in providing the means for peer discussions on real rather than believed performance. Randomized controlled trials within this framework are needed. The study has demonstrated that the majority of the GPs were interested in peer comparison feedback.

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