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The influence of an academic representative on prescribing by general practitioners

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1 The effect of providing information about medicines by a short 'sales' interview between individual general practitioners and an 'academic representative' on prescribing was investigated.

2 The promotional campaign was designed to encourage a rational approach to prescribing of non-steroidal anti-inflammatory agents in an intervention group of 101 general practitioners selected at random from the Leeds Family Practitioner Committee (FPC). The remaining general practitioners in the Leeds FPC acted as a reference group.

3 The prescribing data for each group for 5 months immediately prior to and 5 months following intervention were compared.

4 Intervention produced a significant increase ($P < 0.005$) in the prescribing cost of ibuprofen, the non-steroidal promoted as first choice agent, which was sustained for at least 5 months.

5 Prescribing of the second choice agent, piroxicam, decreased in the reference group but not in the intervention group.

6 There was a decrease in the average prescribing cost of £6.60 per doctor per month in the intervention group compared with the reference group.

Keywords general practitioner prescribing sales representative intervention

Introduction

Drug Information Centres in District Health Authorities provide hospital doctors with independent information on medicines, but there is no equivalent service for doctors in general practice. General practitioners receive information on medicines in many different ways. The principal source is probably the pharmaceutical industry which in the U.K. spends in excess of 20 million pounds annually on product promotion. The Greenfield report (1982) suggested that prescribing in general practice was less than optimal. This conclusion is generally supported by other reviews of GP prescribing (Harris *et al.*, 1984). With the expanding range of pharmaceutical products and increasing concern about drug toxicity there is a need for impartial advice and information on drugs for doctors. It is unlikely that a sum comparable with that spent by the pharmaceutical industry will be made available for this purpose, and any service to general practitioners will have to use efficient methods in order to be cost effective.

Various methods of influencing prescibing have been investigated in the USA (Avorn & Soumerai, 1983). The most effective method was intervention by an academic 'representative', which achieved a 13% reduction in expenditure on the target group of drugs (Soumerai & Avorn, 1986). We have investigated the impact on the prescribing patterns of British general practitioners of an academic 'representative', who presented to them independently reviewed information on drug use in a selected therapeutic area.

Methods

The academic representative

The model of the pharmaceutical sales representative was adopted. A pharmacist was trained to work as a medical representative, to visit doctors and present an independent evaluation of good prescribing practice

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within selected therapeutic areas. Training for the promotional role involved the development of skills in communication and presentation, so that the academic representative could 'compete' with pharmaceutical company representatives. The approach to surgeries for appointments was made in a manner similar to that used by pharmaceutical representatives.

Promotional method

A marketing consultant familiar with pharmaceutical advertising assisted with the design of a marketing profile, including the design of the study literature and promotional aids. The acronym PRIDE—Prescribing Review and Independent Drug Evaluation—was adopted to give a corporate image with which doctors could indentify. The promotional literature comprised an educational message on A4-sized cards which were used as detailing aids during the interview and were then left with the GP to reinforce the message. The presentation was designed to give the necessary information in a succinct form, with maximal visual impact. A poster (Figure 1) aimed at dissuading patients from expecting a 'pill for every ill' was left with the doctor to support the rational prescribing theme.

The educational message

The non-steroidal anti-inflammatory drugs (NSAIDs) were chosen as the target group for the first promotional message. They account for over 20 million prescriptions each year (5% of all National Health Service prescriptions) according to the Committee of Safety on Medicines Update (1986). The cost of treatment with NSAIDs varies widely depending on the choice of preparation, and rational selection could reduce prescribing costs. A promotional message was developed based on review of the literature on NSAIDs and discussed with specialists in this area before the final approach was decided.

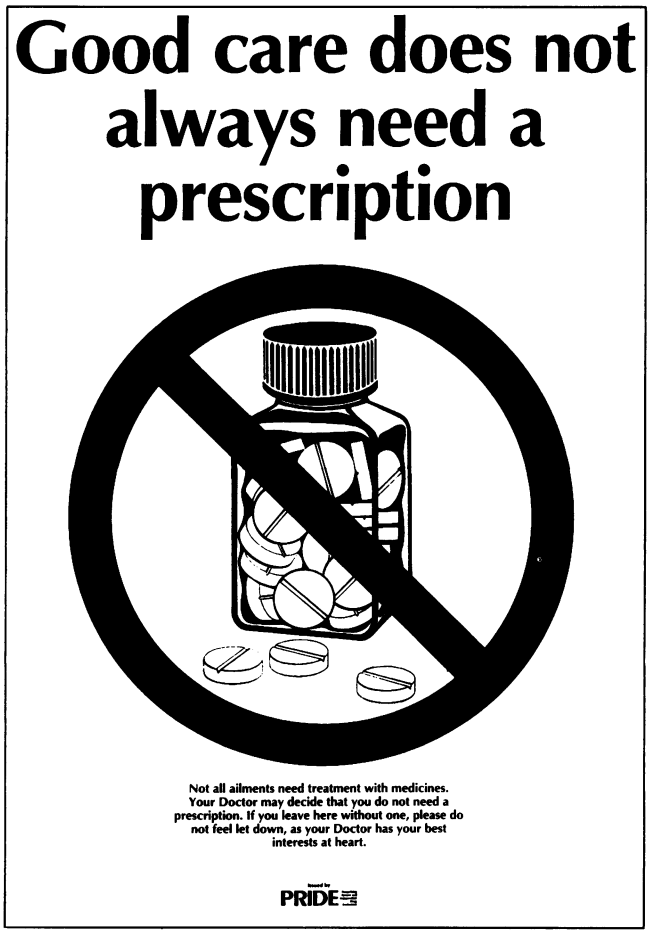


Figure 1 The patient education poster.

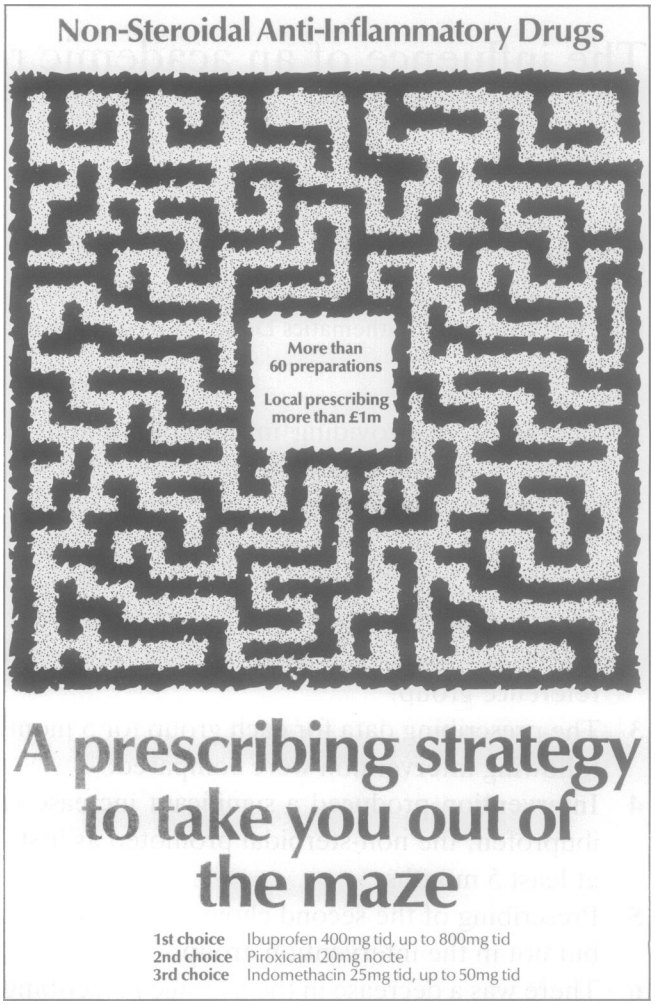
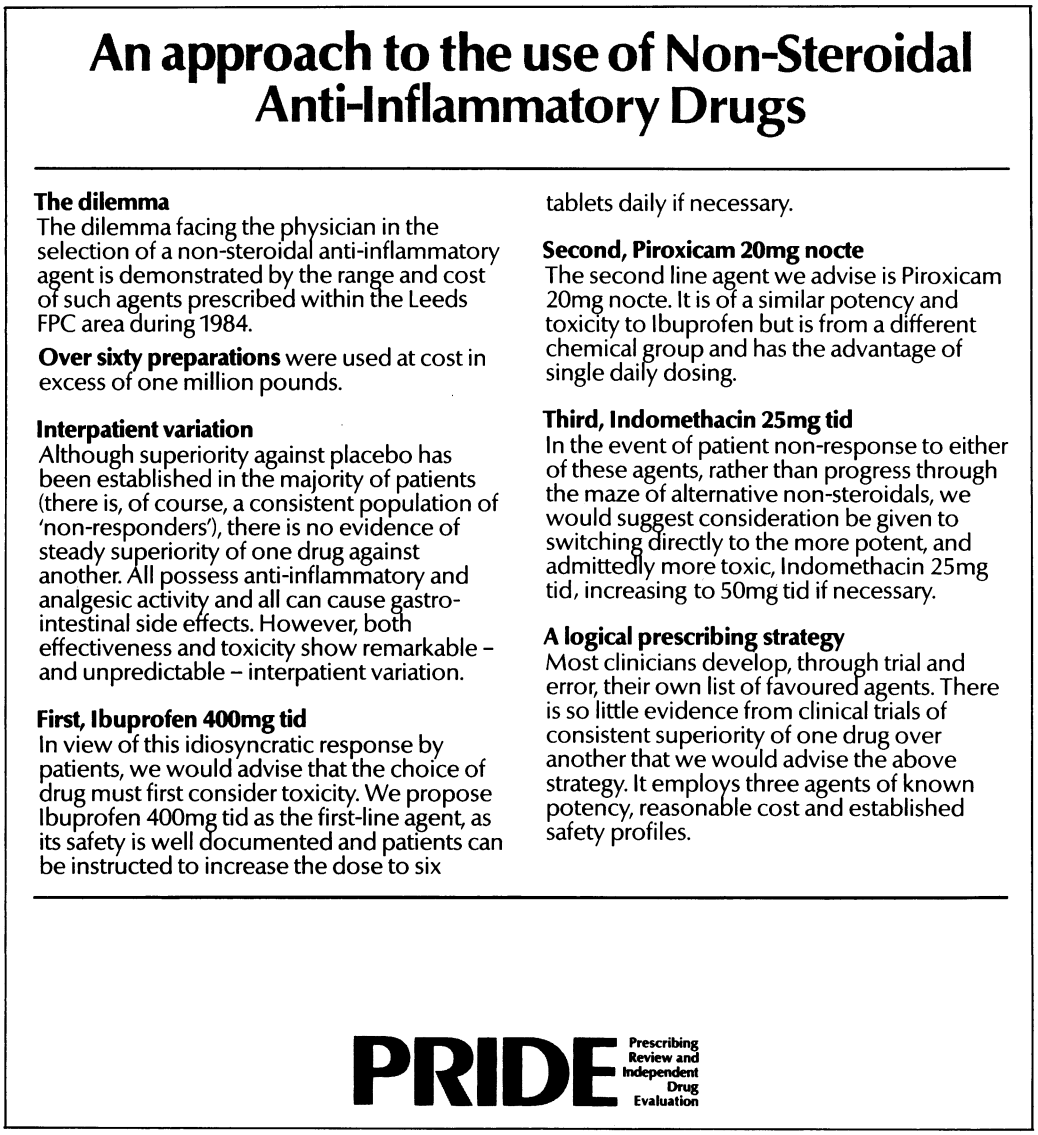


Figure 2 The 'Detailing' card used by the academic representative when presenting the PRIDE message on NSAIDs, Front.

The message advocated a prescribing strategy for this group of drugs which involved employing three agents of known potency, established safety profiles, and reasonable cost, 'to lead the doctor out of the maze' of non-steroidal agents. The strategy was to prescribe ibuprofen as first choice, to move to piroxicam if ibuprofen proved ineffective after a reasonable trial period, and to use indomethacin as a third agent if necessary. The message is illustrated on the promotional literature shown in Figure 2 (front) and Figure 3 (reverse). The thrust of the campaign was to remind doctors that there is little difference between the various NSAIDs, and to encourage them to prescribe drugs from this group in a rational and economical manner.



An approach to the use of Non-Steroidal Anti-Inflammatory Drugs

The dilemma
The dilemma facing the physician in the selection of a non-steroidal anti-inflammatory agent is demonstrated by the range and cost of such agents prescribed within the Leeds FPC area during 1984.

Over sixty preparations were used at cost in excess of one million pounds.

Interpatient variation
Although superiority against placebo has been established in the majority of patients (there is, of course, a consistent population of 'non-responders'), there is no evidence of steady superiority of one drug against another. All possess anti-inflammatory and analgesic activity and all can cause gastro-intestinal side effects. However, both effectiveness and toxicity show remarkable – and unpredictable – interpatient variation.

First, Ibuprofen 400mg tid
In view of this idiosyncratic response by patients, we would advise that the choice of drug must first consider toxicity. We propose Ibuprofen 400mg tid as the first-line agent, as its safety is well documented and patients can be instructed to increase the dose to six tablets daily if necessary.

Second, Piroxicam 20mg nocte
The second line agent we advise is Piroxicam 20mg nocte. It is of a similar potency and toxicity to Ibuprofen but is from a different chemical group and has the advantage of single daily dosing.

Third, Indomethacin 25mg tid
In the event of patient non-response to either of these agents, rather than progress through the maze of alternative non-steroidals, we would suggest consideration be given to switching directly to the more potent, and admittedly more toxic, Indomethacin 25mg tid, increasing to 50mg tid if necessary.

A logical prescribing strategy
Most clinicians develop, through trial and error, their own list of favoured agents. There is so little evidence from clinical trials of consistent superiority of one drug over another that we would advise the above strategy. It employs three agents of known potency, reasonable cost and established safety profiles.

PRIDE Prescribing Review and Independent Drug Evaluation

Figure 3 The 'Detailing' card used by the academic representative when presenting the PRIDE message on NSAIDs, Back.

General practitioner study group

The PRIDE representative was to visit each doctor in a selected intervention group on a single occasion during the promotional campaign, which was planned to run for 3 months in Spring 1986.

The overall prescribing costs for 2 months in 1985 were calculated for all general practitioners in the Leeds FPC and the general practitioners were ranked in descending order of total prescribing costs. They were then stratified into three bands based on their total prescribing costs. An intervention group of 150 doctors from the total of 377 was selected to be representative of the Leeds FPC as a whole. The ratio of doctors working in group practices to those working single handed in the Leeds FPC was 6.8:1, hence seven single handed practitioners and 43 in group practices were selected from each band using random number tables. The remaining general practitioners were assigned to the reference group. Four doctors were eliminated from this group when it was found that they were single handed, and not working in group practices as listed by the FPC, giving a total of 223 in this group. The two groups were similar in regard to practice size, age and geographical location. The reference group did not receive any notification about the study nor any visits from the 'academic representative'.

Data analysis

The Prescription Pricing Authority and the Department of Health and Social Security made available the monthly raw prescribing data for the Leeds FPC for the duration of the study. The data were released from the Information Technology Centre of the Prescription Pricing Authority on magnetic tapes. Selected data were transferred to a microcomputer using Reallink* for further analysis.

A measure was sought which would be sensitive to changes in individual prescribing practice within a selected group of drugs, but would not be affected by monthly variations in expenditure or by inflation. A ratio, termed the prescribing index (PI), was used. The prescribing index is the ratio of the cost of prescribing

of the target drug to the cost of prescribing of competitor drugs plus target drug. For ibuprofen the prescribing index was calculated thus:

$$\text{PI (Ibuprofen)} = \frac{\text{Ibuprofen (£)}}{\text{(all non-target NSAIDs (£) + Ibuprofen (£))}}$$

For an individual doctor the PI describes the propensity to prescribe the target drug. The PI can vary from 0 to 1, with a value of 1 indicating 100% prescribing of the target drug.

The PI is insensitive to inflation provided that the price of both target and non-target NSAIDs is affected similarly by inflation.

Differences in PI within groups were examined using the Wilcoxon's signed-ranks test, and between groups by the Mann Whitney *U*-test.

Results

Study group

Of the 150 general practitioners assigned to the intervention group eight of the doctors had left the FPC, 13 refused to participate in the study, two were due to leave the FPC during the study and 22 were not seen because of holidays or non-availability of an appointment. The remaining 105 general practitioners were visited by the academic representative. Data for four of these were excluded from analysis because no data were available, so that complete data were available for 101 general practitioners in the intervention group. Complete prescribing data were available for 217 of the 223 general practitioners in the reference group.

Prescribing costs pre-intervention

The prescribing costs of doctors were analysed for 5 months prior to and for 5 months post-intervention. The average monthly cost for intervention and reference groups over these two periods for the individual target drugs and all non-target NSAIDs as a group are in Table 1. Before intervention the average cost of ibuprofen in the intervention group was £90.4 (s.e. mean £5.0) compared with £77.5 (s.e. mean £3.8) in the reference group. For piroxicam the corresponding costs were £48.7 (s.e. mean £4.0) and £68.6 (s.e. mean £5.4) and for all other NSAIDs £375.8 (s.e. mean £19.0) and £345.2 (s.e. mean £14.2). The differences between the mean values from each group pre-intervention were not significant, i.e. the groups were similar with regard to the cost of NSAID prescribing.

The pre- and post-intervention PIs for the target drugs are given in Table 2. There was no significant difference between the median PIs for ibuprofen and indomethacin from each group in the pre-intervention period, but there was a significant difference for the PI for piroxicam ($P < 0.05$). General practitioners in the reference group showed a greater propensity to prescribe piroxicam than those in the intervention group before intervention.

The PIs for ibuprofen and piroxicam for each doctor were compared with the total prescribing costs for the doctor. They were found to be independent of the total prescribing costs.

Effect of intervention

The average cost of ibuprofen prescribing increased in the intervention group post-intervention by £15.4 ($P < 0.01$), whereas an increase in the reference group of £2.0 was not significant ($P > 0.05$). The prescribing costs of competitor NSAIDs increased in the reference group by on average £29.6 ($P < 0.05$), but the increase

Table 2 Prescribing Index (PI) for ibuprofen, piroxicam and indomethacin in intervention and reference groups. Median values (lower and upper quartiles)

	Pre-intervention	*Post-intervention*
PI ibuprofen		
Intervention group	0.20	0.24*
$n = 101$	(0.12–0.30)	(0.13–0.31)
Reference group	0.18	0.16**
$n = 217$	(0.10–0.25)	(0.09–0.23)
PI piroxicam		
Intervention group	0.09	0.09
$n = 101$	(0.04–0.16)	(0.05–0.17)
Reference group	0.12†	0.09***
$n = 217$	(0.06–0.23)	(0.05–0.17)
PI indomethacin		
Intervention group	0.11	0.10
$n = 101$	(0.06–0.19)	(0.06–0.18)
Reference group	0.13	0.12
$n = 217$	(0.07–0.19)	(0.06–0.21)

*$P < 0.005$ *vs* pre-intervention value; $P < 0.001$ *vs* post-intervention value in reference group.
**$P < 0.005$ *vs* pre-intervention value.
***$P < 0.001$ *vs* pre-intervention value.
†$P < 0.05$ *vs* pre-intervention value for intervention group.

Table 1 Average cost (s.e. mean) of prescribing in pounds per doctor per month during the pre-intervention and post-intervention months for the Study and Reference groups

	Average monthly cost/GP (£) of prescribed drugs			
	Intervention group		*Reference group*	
Drug	*Pre-*	*Post-*	*Pre-*	*Post-*
Ibuprofen	90.4 (5.0)	106.0 (4.9)	77.5 (3.8)	79.5 (4.1)
Piroxicam	48.7 (4.0)	44.4 (2.1)	68.6 (5.4)	55.3 (3.5)
Indomethacin	45.9 (2.9)	44.0 (4.9)	54.3 (4.0)	53.2 (1.1)
All other NSAIDs	375.8(19.0)	377 (32.0)	345.2(14.2)	374.8(17.8)

in costs in the intervention group of £1.2 was not significant.

The median PI for ibuprofen increased post-intervention in the intervention group ($P < 0.005$) but decreased in the reference group ($P < 0.005$). Comparison between the groups showed a significant difference in median PI for ibuprofen post-intervention ($P < 0.001$) whereas there was no significant difference in pre-intervention PIs for ibuprofen.

In the intervention group there was no change in the cost of prescribing of piroxicam or the PI for piroxicam after intervention. The average cost of prescribing in the reference group showed a decrease of £13.3, but this change was not significant, because of the wide variation in prescribing. However the PI decreased from 0.12 to 0.09 ($P < 0.001$). There was no significant difference in median PI between the groups post-intervention.

There were no significant changes in either the cost of prescribing or the PI for indomethacin after intervention.

The median PI for ibuprofen in each post-intervention month was compared with the pre-intervention PI for the intervention group. The PI increased significantly in months 1 ($P = 0.03$), 3 ($P = 0.001$), 4 ($P = 0.015$) and 5 ($P = 0.04$) but was unchanged in month 2 ($P = 0.46$).

Discussion

The two groups of doctors had broadly similar prescribing practice before intervention as judged by prescribing costs for the target drugs and other NSAIDs, although they did differ with respect to the PI for piroxicam.

The overall cost of prescribing of NSAIDs preparations increased in both groups, the PI for ibuprofen increased in the intervention group but not in the reference group. Change in PI could result from changes in ibuprofen prescribing or a change in prescribing of competitor NSAIDs. The average ibuprofen prescribing cost per doctor increased in the intervention group, by £15.4, but not in the reference group. On the other hand the prescribing costs of competitor NSAIDs increased in the reference group, but not in the intervention group. The PRIDE intervention increased ibuprofen prescribing at the expense of other NSAIDs preparations and the effect was sustained for at least 5 months.

The impact of intervention was measured by the cost of drugs. Had it been measured by the number of tablets prescribed a larger effect could have been expected since ibuprofen is less expensive than most NSAIDs. The estimate of change in the intervention group prescribing is therefore likely to be understated.

The changes in PI for piroxicam in the reference group were caused by a fall in average monthly prescribing cost for piroxicam of £13.3 in the post-intervention period. This probably reflected the concerns raised about the safety of piroxicam in the UK and USA at this time (Fox *et al.*, 1985). The stability of piroxicam prescribing in the intervention group suggests that prescribers were reassured on the safety and efficacy of piroxicam by the independent information.

The overall change in cost of prescribing NSAIDs was a decrease averaging £6.60 per doctor per month in the intervention group, compared to the reference group. This is a small saving per doctor, but it extrapolates to a potential saving of about £30,000 per annum if the PRIDE programme were extended to all general practitioners in Leeds.

These results confirm findings in the USA that prescribers can be influenced by a short professionally produced presentation of information and show that they are applicable to the UK. Such intervention can lead to more rational prescribing and, in this instance, cost-effective prescribing.

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