

Psychotropic drug prescribing

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SUMMARY. This study was based on the recording of psychotropic drug prescribing over two weeks by 269 doctors using practice activity analysis (PAA) data sheets. The overall mean rates for patients receiving one or more psychotropic drugs were 17.5 per 1,000 list size and 130 per 1,000 consultations; and for prescriptions issued the rates were 20.6 per 1,000 list size and 153 per 1,000 consultations. Recorders were classified into five categories 'low' to 'high', by the volume of prescribing and this paper is concerned with the comparison between them. Between the high and low categories there was a twofold difference in the prescribing of new prescriptions, a fourfold difference for continuing prescriptions and a tenfold difference for repeat prescriptions; 51 per cent of all prescriptions were issued as 'repeats'.

Other features of prescribing have been studied in each of the categories. Prescribing rates vary little with workload. Increasing trends are evident from the low to high categories for the use of polytherapy and for the proportion of elderly persons who received prescriptions; the proportion of male patients (28 per cent) was consistent in all categories. The relative proportion of prescriptions by drug group (tranquilizers, antidepressants and hypnotics) was reasonably uniform in all categories.

Introduction

IN the late 1960s and early 1970s, the annual number of prescriptions dispensed for psychotropic drugs was increasing, though in recent years the number has remained stable.¹ Global results, however, conceal considerable variation between doctors. In the study reported by Parish, 8 per cent of adult males and 17 per cent

of adult females were prescribed a psychotropic drug during the course of a year.² These overall mean results were calculated from data for individual general practices where there were twofold differences between the extremes among the five singlehanded, the five two-member and the seven three-member practices. Using consultations as a denominator and a two-week recording period, we have reported similar wide variations among doctors in the UK³ and in Belgium.⁴ There are also wide variations among practitioners in the recognition of psychiatric morbidity.⁵

This study was concerned with the interdoctor variation in prescribing encountered in practice activity analysis (PAA) data. We sought to identify practice or prescribing characteristics which were associated with differences in the levels of prescribing. Returns, received as part of a programme of PAA, have been classified into five prescribing categories (high to low) and we report here aspects of the comparison between them.

Method

Data sheets for psychotropic drugs of acceptable recording quality were completed by 269 general practitioners and sent to the Birmingham Research Unit of the Royal College of General Practitioners during 1980-81. The data sheets contained information (Appendix) about the patients receiving prescriptions (age and sex) and the drugs prescribed (type of drug and mode of prescription). These sheets were submitted by doctors throughout the United Kingdom with a predominance of doctors from the South-East Thames area who were actively engaged in a PAA educational programme. Data sheets submitted by trainees and second or subsequent data sheets from individual doctors were excluded. The total number of consultations during the two weeks, and the practice list for which the recorder considered himself responsible during the period, provided denominators for calculating rates.

Consultation and prescribing data (unweighted means and medians) for recorders within the five prescribing categories were computed and examined for evidence of trends. Relationships between several variables were examined by calculating correlation coefficients; these were interpreted with due regard to sample size, since, with large samples, weak correlations, which may have little or no clinical importance, will be statistically significant.

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Table 1. Classification of prescribing categories. Number of recorders, definition of categories and mean prescribing rates.

Prescribing category and number of recorders	Category : Prescribing rates	Mean category rate	
		Per 1,000 consultations	Per 1,000 list
High, <i>n</i> = 50	>200 per 1,000 consultations >25 per 1,000 list	275	38.0
Interhigh, <i>n</i> = 44	One High and one Middle rate	184	25.6
Middle, <i>n</i> = 93	≥100–200 per 1,000 consultations ≥12.5–25.0 per 1,000 list	143	18.2
Interlow, <i>n</i> = 27	One Low and one Middle rate	91	12.9
Low, <i>n</i> = 55	<100 per 1,000 consultations <12.5 per 1,000 list	60	8.2
All categories, <i>n</i> = 269		153	20.6

Results

The returns were assigned to three main prescribing categories, high, middle and low, according to the criteria specified in Table 1. These categories were determined by the rates of prescribing, using the total number of prescriptions issued as the numerator, and the numbers of consultations and the list sizes as denominators. These two denominators are, of course, highly correlated in most practice situations. The two subsidiary categories, 'interhigh' and 'interlow', include recorders with prescribing rates which produced a different outcome for categorization based on the alternative denominators. Most of these were borderline between one category and the next, but some were assigned to these intermediate categories because the numbers of consultations undertaken were relatively disproportionate to the list size. This applies particularly to female practitioners with a limited list commitment and also to doctors whose partners may have been absent at the time of the study.

For each prescribing category, the unweighted means, the standard deviation and median values for the numbers of consultations, list sizes and for the ratio of consultations per 1,000 list size (a measure of a doctor's response to his patient's demands) are given in Table 2.

This set of consultation data, though containing differences between the categories for individual items of information, should be examined collectively. The only important features are the high values for consultations in the interhigh category which relate to the method of categorization, and the relatively low values for consultations per 1,000 list in the middle category which cannot be explained. No trends are evident across the five categories.

Multiple prescribing (polytherapy) is next considered, and Table 3 gives the mean and median values of the ratio of prescriptions per patient for recorders in each prescribing category (minimum ratio = 1). The overall mean ratio was 1.18 and varied from 1.24 in the high category to 1.09 in the low; a consistent trend was also evident in the medians. However, the 13–14 per cent differences between these extremes are relatively insignificant when compared with the 400 per cent difference in total prescribing which exists between them.

The mean, standard deviation and median values for the proportion of elderly persons (aged 65 and over) receiving psychotropic drugs is given in Table 4. A pronounced bias towards the elderly is evident for recorders in the higher prescribing categories. Distribution by sex was reasonably uniform at around 28 per

Table 2. Number of consultations, list size, consultations per 1,000 list. Mean, standard deviation (SD) and median values by prescribing category.

Prescribing category	Consultations		List size		Consultations per 1,000 list	
	Mean (SD)	Median	Mean (SD)	Median	Mean (SD)	Median
High	323 (81)	306	2,342 (625)	2,240	143 (45)	134
Interhigh	361 (91)	360	2,602 (738)	2,402	145 (42)	154
Middle	322 (84)	317	2,537 (623)	2,500	129 (26)	128
Interlow	344 (148)	311	2,434 (600)	2,340	144 (54)	143
Low	311 (83)	311	2,278 (540)	2,282	139 (30)	134
All	328 (94)	325	2,448 (633)	2,400	138 (37)	134

Table 3. Number of items prescribed per patient (receiving prescriptions). Mean and median values by prescribing category.

Prescribing category	Mean	Median
High	1.24	1.21
Interhigh	1.23	1.18
Middle	1.18	1.14
Interlow	1.12	1.10
Low	1.09	1.06
All	1.18	1.15

cent for males and 72 per cent for females. The practical interpretation of these distributions in two weeks' experience in the consulting room is illustrated in Table 5. Overall there was an average of 43 patients receiving drugs (standardized to the average list of the study) and 15 of these patients were aged 65 and over. It should be noted that doctors in the low prescriber category prescribed for 19 patients altogether, and this equals the number of patients under 45 years of age who received drugs from the average high prescriber.

The unweighted mean prescribing rates per 1,000 list for each prescribing mode are presented graphically in Figure 1. Rates for new prescriptions (NP) do not vary significantly between the categories low to interhigh, though that for the high category is significantly greater than the rate for the interhigh ($T=2.64, P<0.01$). Rates for continuing prescriptions issued at consultation (CP) and repeat prescriptions issued without consultation (RP) increase rapidly and uniformly through the categories with fourfold and tenfold differences respectively between the extremes. In the low category the mean rate for repeat prescriptions was less than that in the other two prescribing modes whereas in all remaining categories it was greater.

Prescribing in the repeat mode accounted for half of all prescriptions issued. The relative proportion of repeat prescriptions was 26 per cent in the low category, 43 per cent in the interlow, 49 per cent in the middle, 54 per cent in the interhigh and 58 per cent in the high. Each category value is significantly greater than the one below it (for example, high versus interhigh, chi squared = 7.2, 1 df; $P<0.01$).

The unweighted mean prescribing rates for each of the three main groups of psychotropic drug—tranquillizers (TR), antidepressants (AD) and hypnotics (HYP)—are shown in Figure 2. The patterns of prescribing within each category are broadly similar.

Correlation studies

The associations between prescribing of the three drug groups by the 269 recorders are indicated by the following correlation coefficients (Spearman): number of tranquillizers versus number of antidepressants—0.58; number of tranquillizers versus number of hypnotics—

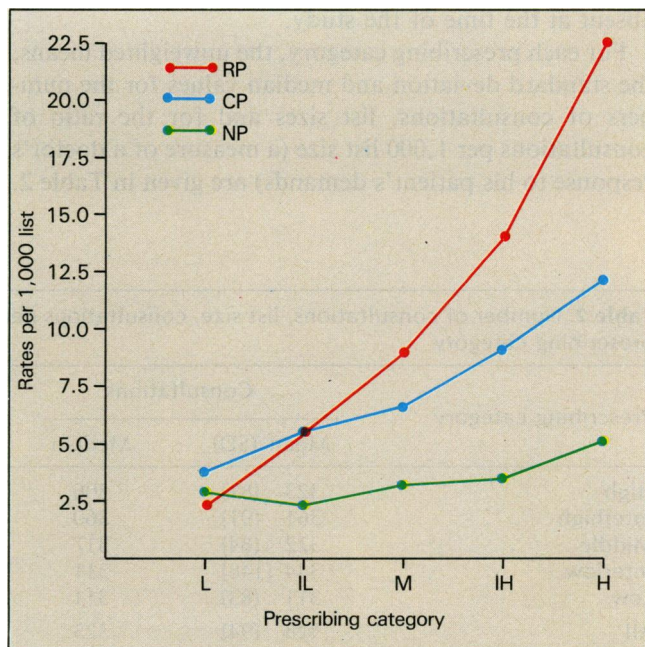
Table 4. Percentage of recipients of psychotropic drugs who were aged over 65 years. Mean, standard deviation (SD), and median values of prescribing category distributions.

Prescribing category	Mean (SD)	Median
High	38.1 (14.8)	39.8
Interhigh	37.6 (17.1)	35.7
Middle	35.4 (14.8)	37.5
Interlow	29.0 (12.5)	27.7
Low	22.0 (16.5)	21.2
All	32.9 (16.4)	33.3

Table 5. Average number of persons receiving psychotropic drugs by age group in each prescribing category. Standardized to average list (2,448 patients) (nearest whole numbers).

Prescribing category	Age group (years)			All patients
	<45	45-64	65+	
High	19	27	30	76
Interhigh	15	18	18	51
Middle	11	14	14	39
Interlow	10	11	8	29
Low	8	6	5	19
All	13	15	15	43

Figure 1. Drug prescription rates per 1,000 list by prescribing category and mode. Abbreviations: RP, repeat prescriptions; CP, continuing prescriptions; NP, new prescriptions; L, low; IL, interlow; M, middle; IH, interhigh; H, high. Unweighted means for all categories are: RP, 10.5; CP, 7.1; NP, 3.4.



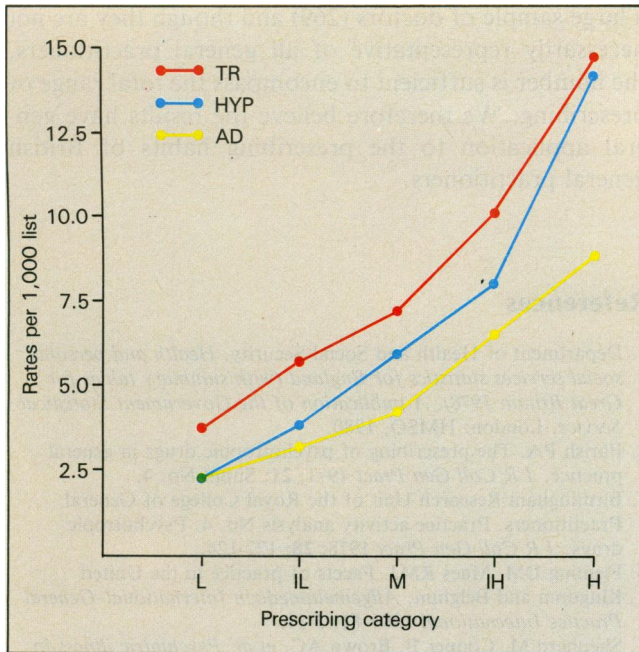


Figure 2. Drug prescription rates per 1,000 list by prescribing category and drug group. Abbreviations: TR, tranquillizers; HYP, hypnotics; AD, anti-depressants. Unweighted means for all categories are: TR, 8.1; HYP, 6.8; AD, 4.8.

0.63; number of antidepressants versus number of hypnotics—0.52.

These values are all significant ($P < 0.001$) and are of such a magnitude that they indicate that doctors who prescribed one group of drugs frequently, were also likely to be frequent prescribers of the other two. Correlations between the proportion of elderly persons receiving drugs and the prescribing rates for hypnotics (0.50) and for repeat prescriptions (0.48) were notably and significantly high. By contrast, the correlations of the proportions of elderly persons with the other two drug groups were 0.19 and 0.23. The correlations of the other two prescribing modes were both 0.1.

Correlation coefficients between patient prescribing rate (patients receiving drugs per 1,000 list) and the number of consultations and consultation rate per 1,000 list are 0.20 and 0.28 respectively. These are significant ($P < 0.01$), though of low magnitude indicating only a weak association between patient prescribing rate and workload.

Dosage and quantity

A classification of prescribing based on frequency has limitations, though in practical terms it is inconceivable that prescribers in the low category prescribed 10 times the quantity as those in the high category when issuing repeat prescriptions and only twice the quantity when issuing new prescriptions. In material made available to

us by the Prescription Pricing Authority, we have been able to compare the dose and quantity prescribed by 34 of the recorders. Diazepam (Valium) and nitrazepam (Mogadon) have been used as indicator drugs, and results of the comparison are summarized in Table 6. Differences between categories for dose and quantity of tablets prescribed are in general small. There is no suggestion that the high prescribers prescribed in reduced quantity. The proportion of all prescription forms which contained a psychotropic item is also reported in this table, where there is a slight trend towards the high prescribers. Without data regarding consultations in which no prescription was generated, we cannot pursue this point.

Cost implications

The average number of prescriptions per doctor issued in two weeks by 269 recorders was 50. After standardization to the average list size of 2,448, the average was 93 prescriptions for the high prescriber and 20 for the low. At a conservative estimate of £2 per prescription, the average prescriber therefore issued prescriptions worth £100 in two weeks, and the difference between the average low prescriber and the average high prescriber amounted to £146 (annual equivalent £3,800).

Discussion

Categorization was based on rates using both the numbers of consultations and the list size as denominators. Prescribing rates for the three drug groups and the three

Table 6. Prescription analysis. Diazepam and nitrazepam: quantity and daily dose (where specified) as means of prescribing category. Psychotropic drugs: proportion (%) of prescription forms containing at least one psychotropic drug.

	Prescribing category (number of patients)				
	High (n=14)	Inter-high (n=6)	Middle (n=8)	Inter-low (n=6)	All (n=34)
<i>Diazepam</i>					
2 mg tabs	80	66	59	58	67
5 mg tabs	68	64	71	50	67
Daily dose (mg)	10.2	10.0	10.0	8.4	9.8
<i>Nitrazepam</i>					
5 mg tabs	48	46	48	40	46
Daily dose (mg)	6.9	6.4	7.1	6.5	6.6
<i>Psychotropic drugs</i>					
Proportion of prescription forms with at least one psychotropic drug	22.7	20.8	18.7	14.4	19.9

prescribing modes presented in this report are based only on the estimated list size as denominator. The material has also been analysed using the numbers of consultations as denominator, with similar results. Neither the list size nor the number of consultations provides the ideal denominator, but the fact that the same conclusions were derived from both sets of analyses overcomes the objections to them individually.

Consultations, list size and consultation rates per 1,000 list are all measures of workload which were not appreciably associated with the rates of prescribing. Time for psychiatric counselling may be made available by reducing the average list size but it is questionable whether it would influence a general practitioner's prescribing pattern.

The distribution by drug group observed within the categories is similar, suggesting that the spectrum of illness seen is also similar. The main difference between the categories lies in the duration of treatment indicated by the rates for continuing and repeat prescriptions. The patient's age influences prescribing but does not explain high prescribing: high prescribers issue prescriptions more frequently for patients of all ages. The independent prescription analysis based on a four-week recording period demonstrated that there were no major differences between the categories regarding the dose and quantity of drug prescribed.

The extent of the variation between the categories indicates a complete lack of consensus among general practitioners about the prescribing of psychotropic drugs; what is worse, there is no basis for deciding whether high or low prescribing results in a better service for the patients. High prescribing (especially in the continuing and repeat modes) would be justified if there was a reduced incidence of patients appearing with new episodes of illness, but the high prescribers reported increased rates for new prescriptions. Among the other four categories, the indications for prescribing in a new episode of illness or even as a therapeutic test were perceived by doctors with a reasonable consistency and this is the only important consensus among them. If the level of prescribing of psychotropic drugs is a problem (financial or clinical), then medical education should be directed towards recognizing target endpoints. These may be 'positive' (for example, cure) or 'negative' (for example, when the continuation of medication is serving no therapeutic purpose). The negative endpoint is particularly relevant in areas such as psychotropic prescribing because of the dangers of habit formation and drug abuse. Regulatory mechanisms within practices for the control of repeat prescriptions are essential.

It is pertinent in conclusion to draw attention to the cost implications. The drugs included in this analysis account for about 10 per cent of the total drug bill, and within that 10 per cent there is an estimated annual difference of £3,800 between the average low prescriber and the average high prescriber. The study was based on

a large sample of doctors (269) and though they are not necessarily representative of all general practitioners, the number is sufficient to encompass the total range of prescribing. We therefore believe the results have general application to the prescribing habits of British general practitioners.

References

1. Department of Health and Social Security. *Health and personal social services statistics for England (with summary tables for Great Britain 1978)*. A publication of the Government Statistical Service. London: HMSO, 1980.
2. Parish PA. The prescribing of psychotropic drugs in general practice. *J R Coll Gen Pract* 1971; 21: Suppl No. 4.
3. Birmingham Research Unit of the Royal College of General Practitioners. Practice activity analysis No. 4. Psychotropic drugs. *J R Coll Gen Pract* 1978; 28: 122-124.
4. Fleming DM, Maes RMJ. Facets of practice in the United Kingdom and Belgium. *Allgemeinmedizin International-General Practice International* 1980-81: 5-11.
5. Shepherd M, Cooper B, Brown AC, et al. *Psychiatric illness in general practice*. Oxford University Press, 1966.

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Appendix

Content of data sheet

1. Number of prescriptions issued for the following classified psychotropic drugs.
 - Phenothiazines
 - Minor tranquillizers: diazepam, chlordiazepoxide, others
 - Antidepressants: tricyclics, MAO inhibitors, others
 - Hypnotics: barbiturates, nonbarbiturates
 - Others
2. Number of consultations undertaken during the two weeks by day and location (surgery consulting session, at home, at special practice clinic).
3. Age and sex distribution of patients issued with one or more psychotropic drugs.
4. Type of practice.
5. Status of recorder.
6. Size of practice (total list) and estimated contribution (percentage) of recorder to practice during the study period.
7. Name and address of recorder.