PAPERS AND ORIGINALS

Use of medicines in general practice

D C G SKEGG, RICHARD DOLL, J PERRY

British Medical Journal, 1977, **1**, 1561-1563

Summary

The prescriptions issued by general practitioners to a population of about 40 000 people were studied. During one year 53·8% of all males and 65·7% of all females had at least one drug dispensed. The proportion receiving medicines increased with age and was higher among females at all ages. Psychotropic drugs were prescribed more often than any other group and accounted for almost one-fifth of all prescriptions. Altogether 9·7% of the males in the population and 21·0% of the females received at least one psychotropic drug during the year. Among women aged 45-59 33·0% received a psychotropic drug, and 11·2% were given an antidepressant. Although antimicrobial drugs were prescribed less often than psychotropic drugs, they were given to more people.

Introduction

The prescribing habits of general practitioners have been studied,[1-3] but there is a dearth of information about the distribution of prescriptions among their patients. In particular, we know little about the proportion of people who are prescribed specific drugs within a given interval of time. Such information was acquired incidentally in the course of an investigation being carried out into methods of monitoring drugs in general practice,[4] and we report here the results relating to the use of medicines by about 40 000 people during the 12 months from 1 March 1974.

Department of the Regius Professor of Medicine, University of Oxford, Oxford OX2 6HE

D C G SKEGG, BMEDSC, MB, lecturer in epidemiology
RICHARD DOLL, FRCP, FRS, regius professor of medicine
J PERRY, MB, DMRT, director, Oxford Community Health Project

Methods

The population studied consisted of the people registered with 19 general practitioners, who were working in five group practices. One practice was in Oxford city, three were in Oxfordshire, and one was in Worcestershire. Three of the practices dispensed for some of their patients.

Basic information about the people in the population—for example, sex and date of birth—was available from the computer records of the Oxford Community Health Project. The Prescription Pricing Authority provided photocopies of all FP10 prescription forms bearing the stamps of the participating doctors. These included prescriptions written by the practitioners' assistants and locums (who used the prescription forms of the principals) but not those written by other medical practitioners—for example, hospital doctors. The method ensured that only prescriptions actually dispensed were included.

Information from each prescription was coded and added to the patient's computer record. All complete items prescribed were treated independently, irrespective of whether two or more were written on the same form. In this report a "prescription" therefore means a prescription for one medicine. Prescriptions for items other than drugs were omitted.

The practitioners were not provided with information about their prescribing until after the period covered by this report, so their prescriptions were not biased by knowledge of the results.

Results

Altogether 163 759 prescriptions were dispensed during the year. Since the average population was 40 673, the mean prescription rate was 4·0 per person per year.

In calculating the distribution of prescriptions among individuals, analyses were confined to the 36 280 people who were registered with the practices throughout the year. Table I shows the age distribution of this population and the percentages of people of each sex and age group who received medicines. During the year 53·8% of all males and 65·7% of all females were given at least one drug. Among males the proportion declined to a minimum at 15 to 29 years of age, but then increased with age. Among females the proportion increased continuously with age. In every age group a higher proportion of women than men had drug treatment. These characteristics were more obvious among people who received many prescriptions. Twenty or more prescriptions were given to 4·4% of the people during the year, and one elderly man received over a hundred.

TABLE I—*Percentages of people who had different numbers of prescriptions dispensed during the year according to sex and age*

Age (years)	Population		% of people prescribed:					
			Any drug		≥5 prescriptions		≥20 prescriptions	
	M	F	M	F	M	F	M	F
≤14	4776	4275	58·8	60·0	14·9	15·6	0·6	0·7
15–29	4072	4381	44·4	63·5	7·7	23·1	0·5	1·2
30–44	3543	3671	48·7	66·5	14·2	31·0	1·5	3·9
45–59	2984	3118	55·5	69·4	23·2	37·7	4·8	8·6
60–74	1992	2108	63·1	69·8	37·2	46·5	10·4	15·7
≥75	415	945	75·7	78·2	55·4	61·2	20·2	24·3
All ages	17 782	18 498	53·8	65·7	17·9	30·0	3·0	5·7

Nearly 2000 brands of medicine were prescribed, but 10 compounds accounted for a quarter of all prescriptions. The two drugs prescribed most often were diazepam (4·3% of all prescriptions) and ampicillin (3·8%). Each drug was classified according to a modification of the new therapeutic classification devised by the Department of Health and Social Security.[5] Almost 80% of prescriptions were for drugs from the seven classes shown in table II.

TABLE II—*Major classes of drugs prescribed, with the percentages of people who had prescriptions dispensed during year*

Therapeutic class	% of all prescriptions	% of males	% of females*
Psychotropic	17·4	9·7	21·0 (20·0)
Antimicrobial (excluding topical preparations)	14·3	25·5	30·6 (31·1)
Cardiovascular (including diuretics)	12·3	4·9	9·2 (8·2)
Respiratory	10·0	14·1	16·3 (16·4)
Nervous system (excluding psychotropic)	9·5	11·7	17·1 (16·3)
Dermatological	7·8	13·1	17·2 (17·1)
Alimentary	7·3	9·8	12·5 (11·8)
All others	21·3	—	—

*Percentages standardised to age distribution of male population shown in parentheses.

PSYCHOTROPIC DRUGS

Psychotropic drugs comprise sedatives, hypnotics, tranquillisers, antidepressants, stimulants, and appetite suppressants. These were prescribed more often than any other group of drugs and accounted for almost one-fifth of all prescriptions. During the year 9·7% of the males in the population and 21·0% of the females received at least one psychotropic drug. These figures do not include prescriptions for "hidden psychotropics"—that is, those combined with more important amounts of other agents for treating conditions such as asthma or dyspepsia; such compounds are classified in table II according to their main constituent.

Table III shows the distribution of psychotropic drug prescriptions according to sex and age. In every age group a higher proportion of females than males received these drugs although the difference was slight in childhood. There was a sharp increase in the proportion of people having these drugs with age. Among women it was notably high in middle age (33·0%), but the highest proportion was still found at 75 years or older (37·7%). Table III also shows the proportions of people given five or more prescriptions and those who received psychotropic drugs during each of the three four-month periods in the year. The latter was chosen as a crude indicator of regular use; 11·5% of all women aged 30 or older met this criterion.

TABLE III—*Percentages of people who received psychotropic drugs during year according to sex and age*

Age (years)	% of people prescribed:					
	Any psychotropic drug		≥5 prescriptions		At least 1 prescription every 4 months	
	M	F	M	F	M	F
≤14	3·7	4·0	0·1	0·3	0·1	0·3
15–29	4·9	15·5	0·6	2·0	0·5	1·3
30–44	11·5	27·2	2·7	7·6	2·7	6·8
45–59	15·3	33·0	4·7	12·9	4·3	12·1
60–74	18·2	31·5	6·6	14·7	6·6	14·6
≥75	27·2	37·7	13·3	20·2	13·3	21·2
All ages	9·7	21·0	2·5	6·9	2·4	6·5

Distributions by sex and age were similar for each of the three largest groups of psychotropic agents (table IV). In this analysis people who received hidden psychotropics were also included.

TABLE IV—*Percentages of people who received preparations containing certain groups of psychotropic drugs during year according to sex and age*

Age (years)	% of people prescribed:					
	Sedatives or hypnotics		Antipsychotic tranquillisers		Antidepressants	
	M	F	M	F	M	F
≤14	2·8	2·9	0·7	0·6	1·0	0·7
15–29	3·6	10·8	1·2	2·7	1·2	5·0
30–44	8·8	20·3	2·5	4·8	3·2	8·9
45–59	11·6	24·9	3·1	7·5	4·4	11·2
60–74	14·3	24·7	4·4	6·9	4·4	8·7
≥75	21·4	29·9	8·0	12·6	7·2	8·9
All ages	7·4	15·8	2·2	4·4	2·6	6·5

The sedative-hypnotic group included so-called minor tranquillisers, such as the benzodiazepines. The most commonly prescribed drugs were diazepam, nitrazepam, and chlordiazepoxide. Diazepam was given to 6·1% of all people in the population.

The antipsychotic tranquillisers (or neuroleptics) prescribed were mostly phenothiazines. Some—for example, prochlorperazine—are often used for conditions other than psychiatric disease. The largest group of antidepressants (the tricyclic group) also commonly have a non-psychiatric indication in childhood (enuresis) but not in adult life. The frequency of antidepressant medication was particularly high among middle-aged women: 11·2% of women aged 45–59 years received at least one of these drugs.

OTHER THERAPEUTIC CLASSES

Infections—Preparations for treating infections were not prescribed as often as psychotropic drugs, but prescriptions were seldom repeated and so the drugs were given to more people: 28·1% of all individuals received at least one of these drugs during the year. The proportion was highest among children and old men (table V). Nearly two-thirds of the prescriptions were for penicillins.

TABLE V—*Percentages of people who received antimicrobial drugs (excluding topical preparations) during the year, according to sex and age*

Age (years)	% of people prescribed:			
	Any antimicrobial drug		≥5 prescriptions	
	M	F	M	F
≤14	39·2	39·6	3·5	3·6
15–29	19·8	29·5	0·6	1·3
30–44	20·3	29·9	0·6	1·3
45–59	18·7	25·1	1·2	1·4
60–74	22·4	25·5	2·4	1·9
≥75	30·6	27·1	4·3	1·7
All ages	25·5	30·6	1·8	1·9

Cardiovascular system—Drugs acting on the cardiovascular system were given to 4·9% of males and 9·2% of females during the year. There was a pronounced increase in the percentage of people having these drugs with age. At the age of 75 or older 33·3% of the men and 34·7% of the women received one or more of these drugs. Over a third of the prescriptions were for diuretics.

Respiratory system—The age distribution of people given preparations acting on the respiratory system was different. The proportion

increased with age among adults, but it was highest in childhood and lowest among young adults. Two compounds (Phensedyl cough linctus and various preparations of salbutamol) accounted for one-third of all such prescriptions.

Nervous system—Most preparations acting on the nervous system, other than psychotropic drugs, were analgesics. The proportion of people receiving them increased with age and was, at all ages, higher among females. The most commonly prescribed analgesic was a proprietary combination of dextropropoxyphene and paracetamol (Distalgesic).

Skin—Between 10% and 20% of individuals at all ages received a topical skin preparation during the year. Over half these preparations contained an anti-inflammatory steroid.

Alimentary system—Drugs acting on the alimentary system were most commonly prescribed for the elderly. About a third were prescriptions for antacids.

Other drugs—Classes of medicines not listed in table II were endocrinological preparations including oral contraceptives (4·6% of all prescriptions); drugs specifically for rheumatic diseases (4·5%); preparations affecting nutrition and blood (4·0%), mucous membranes (3·0%), allergic reactions (2·3%), and the eye (1·6%); and miscellaneous compounds (1·2%).

Discussion

During one year 60% of a population of about 40 000 people of all ages were prescribed medicines by their general practitioners, and 24% received five or more items. The design of the study ensured that only medicines that were dispensed were recorded, but the proportion of people who actually took the drugs is not known. The figures are, however, likely to be gross underestimates of the proportion of people who take drugs, since self-medication is even commoner than the use of prescribed medicines.[6 7]

The figures would have been higher if we had been able to include drugs that were not prescribed by general practitioners on FP10 forms. When the study was carried out oral contraceptives were not generally prescribed in this way, and other prescriptions would have been given by doctors in hospitals and elsewhere. This last factor partly explains why the mean number of prescriptions for all drugs per person (4·0) was lower than the national average for 1974 (6·0), which was derived from pricing records of all prescriptions dispensed by retail pharmacies.[8] There were other reasons for the difference: (*a*) the national figure included prescriptions for items other than drugs, which were not recorded in our study; (*b*) the study population had a smaller proportion of elderly people than England and Wales as a whole;[9] (*c*) a few prescriptions may have been overlooked by the pricing bureau and so not recorded in our study; and (*d*) any inflation of the doctors' lists—that is, retention of patients who had actually left the practices—would have lowered the average that we obtained.

General practitioners vary in their choice of particular medicines, and the drugs favoured by the 19 doctors in this study may not have been typical of those prescribed in the country as a whole. Nevertheless, the proportions of prescriptions for each therapeutic class were very similar to estimates based on national samples.[8] For example, psychotropic drugs represent 17·7% and antimicrobial drugs represent 14·3% of all drugs prescribed nationally, and in our collaborating practices the proportions were 17·4% and 14·3% respectively.

The special feature of our study is that accurate information was available on the distribution of prescriptions to identifiable individuals within a defined population. This allowed us to examine the figures according to sex and age. It also showed that whereas more psychotropic drugs were prescribed than any other class, more people actually received antimicrobials.

Discussions of prescribing habits often centre on the cost of medicines. This is undoubtedly a major problem: £249 million was spent on pharmaceutical services in England during the year ended 31 March 1974 compared with £188 million on general medical services.[8] But doctors also have an obligation to scrutinise the effectiveness of treatment and to limit the burden of drug-induced disease. The extent of prescribing of psychotropic drugs, which is not peculiar to Britain,[10] is disturbing for several reasons. The efficacy of many of them is uncertain, especially when dispensed so widely. The benzodiazepines are thought to be relatively free of serious side effects, but this is not true of the phenothiazines and tricyclic antidepressants, which were also prescribed often. One possible side effect of psychotropic drugs that is unmeasured is impairment of judgment, which might be a cause of road accidents.[11 12] Whether such extensive use of drugs capable of modifying behaviour has undesirable medical or social consequences is unknown, and more information is certainly needed

The following general practitioners participated in this study: Drs R S Pinches, A M Semmence, W R Smith, P H L Tate (Abingdon); T J Huins, D L Parker, P M M Pritchard (Berinsfield); G T Smith, R H Stephenson, J M Talbot, A J Tulloch (Bicester); J P D Blacker, A V Cowan, V W M Drury, R C W Wynne (Bromsgrove); P A Lawrence, D H Richards, R G Seaver, A E Wager (Oxford). We thank these doctors and their staff for their willing help. We also thank Mrs B Martin and her team of coders for clerical work; Sue Collins, John Dunleavy, and John Evans for systems development and programming; and the Pricing Authority for providing copies of the prescriptions. Professor D G Grahame-Smith and Dr D H Gath gave valuable advice.

References

1 Medical Sociology Research Centre, *Journal of the Royal College of General Practitioners*, 1976, **26**, suppl No 1.
2 Bain, D J G, and Haines, A J, *Journal of the Royal College of General Practitioners*, 1975, **25**, 41.
3 Taylor, R J, *Journal of the Royal College of General Practitioners*, 1977, **27**, 79.
4 Skegg, D C G, paper presented at International Workshop on the Future of Drug Monitoring for Safety, Honolulu, January, 1977. (To be published.)
5 Department of Health and Social Security, *Drug Master Index*. Unpublished, 1976.
6 Dunnell, K, and Cartwright, A, *Medicine Takers, Prescribers and Hoarders*. London, Routledge and Kegan Paul, 1972.
7 Kohn, R, and White, K L (editors), *Health Care: An International Study*, chap 9. London, Oxford University Press, 1976.
8 Department of Health and Social Security, *Health and Personal Social Services Statistics for England, 1975*. London, HMSO, 1976.
9 Office of Population Censuses and Surveys, *Population Trends 6*, table 15. London, HMSO, 1976.
10 Balter, M B, Levine, J, and Manheimer, D I, *New England Journal of Medicine*, 1974, **290**, 769.
11 Betts, T A, Clayton, A B, and Mackay, G M, *British Medical Journal*, 1972, **4**, 580.
12 Reilly, W J, *British Medical Journal*, 1975, **4**, 223.

(*Accepted 1 April 1977*)