Following advice in general practice

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SUMMARY. A random sample of 521 patients to whom prescriptions had been issued in an urban general practice were investigated to see how well they followed advice about taking medicines.

Most factors that have been previously reported as affecting this did not appear to do so. A very high degree of compliance was achieved and it is suggested that the key factor in this is the relationship between doctor and patient.

Introduction

The question of whether patients take their tablets has occupied the minds of many research workers during the past 15 years. The literature reveals that over 300 papers dealing with compliance have appeared in the English language during this time. Attention has been focused on various ways of recording compliance objectively, including direct measurement of tracer substances in blood and urine, measurement of levels of drugs in blood and urine, and counting residual tablets during courses of treatment. Subjective methods include interviewing the patient, the clinician, or the patient's family, or examining the recording charts.

Factors believed to influence compliance by patients, such as age, sex, sociodemographic features of patients, the quantity and frequency of drugs that have to be taken, the doctor/patient relationship, and the nature of the disease being treated have been explored.

Few studies have been carried out in the United Kingdom. Bonnar *et al.* (1969) looked at antenatal iron medication in two groups of women, one of whom received their tablets free at a clinic and the other at normal prescription cost. Gibberd and his colleagues (1970) compared serum levels of phenytoin in epileptics treated as outpatients and those treated as inpatients. Johnson and Freeman (1972) investigated long-acting tranquillisers in outpatient schizophrenics and in another paper Parkes *et al.* (1962) looked at compliance in general practice of schizophrenics followed up one year after discharge from hospital.

All these papers studied patients whose treatment had been initiated, or was being controlled by, the hospital. Everyone found the level of compliance by patients to be poor. An editorial in *The Lancet* referring to inpatients said, " there is a widespread assumption that they receive and take their medication as prescribed. Whenever this assumption is examined objectively the results are disquieting."

It has been assumed that the compliance of patients treated as outpatients or in

general practice is worse. Gatley *et al.* (1968) in a study of 86 patients in general practice found a degree of unreliability directly proportional to the frequency of dosage.

The first major study of compliance in general practice in this country was reported by Porter (1969). He looked at the compliance rates in his practice of four groups of patients: depressives, pregnant women on iron, some patients on short-term antibiotics, and a group on long-term treatment of chronic disease. He found no evidence of widespread defaulting in the group of depressives, but that almost one third of patients on short-term antibiotics stopped prematurely or took them in a desultory fashion. However, the percentage of occult defaulters, that is, those who did not admit to defaulting, compared favourably with published findings from hospitals.

Aim

Our study sought to examine compliance in a random sample of patients in a single general practice.

Method

The practice

The practice has a list size of about 9,000 patients in an urban residential area looked after by four principals and a trainee. For the period of the study one doctor in rotation made a carbon copy of all the prescriptions he wrote on each day of the week.

A sample of one in ten of these prescriptions was taken by an independent observer. Prescriptions containing tablets or capsules were looked at in the survey. Prescriptions containing medication in some other form, mixtures, topicals or aerosols, were excluded and the next prescription containing tablets or capsules was taken. In this way 521 prescriptions given to patients were finally selected; 355 were for females (68·1 per cent) and 166 for males (31·8 per cent).

TABLE 1
AGE AND SEX OF PATIENTS IN SURVEY

	Age in years						
	1–10	*11–20*	*21–40*	*41–60*	*61–70*	*70+*	*Total*
Male	31	17	42	41	20	15	166
Female	35	26	98	120	37	39	355
Total	66	43	140	161	57	54	521

TABLE 2
SOCIAL CLASS DISTRIBUTION (REGISTRAR GENERAL, 1966)

	1	*2*	*3*	*4*	*5*
Number	14	78	182	198	49
Per cent	*2*	*15*	*35*	*38*	*10*

The majority of prescriptions 276 (53 per cent) were 'first' prescriptions, that is they had not been prescribed for a continuous and consecutive period before that date. There were 145 (28 per cent) repeat prescriptions issued at consultation by the doctor as part of a continuous course of treatment and 100 (19 per cent) were repeat prescriptions requested by the patient by post or telephone and without seeing the doctor on that occasion. The age, sex, and social class distribution within those three groups were all comparable with the total group. Eleven per cent of the patients studied lived alone.

Sixty-six per cent of all prescriptions issued had only one form of tablet on them, 23 per cent had two varieties of tablet, six per cent had three varieties of tablet, three per cent had four varieties of tablet, and the remaining two per cent had five or more varieties of tablet on each prescription.

Measurements of compliance

Two methods of measuring compliance were adopted. In one, an independent observer visited the patient at home, unannounced, two thirds of the way through the prescribed course of treatment, interviewed the patient and counted the residual tablets. It was found that by timing the visits during the evening the patient could usually be interviewed at the first visit. If the patient was out, a second visit was made the next day. Two hundred and eighty-four patients (54 per cent) were interviewed in this way.

The remaining 237 patients (46 per cent) were sent a postal questionnaire timed to arrive before the course of treatment was completed and including an explanatory letter signed by the doctor who had issued the prescription. It asked the patient to state the number of tablets left, but did not explain explicitly the reason for this check. A one in ten sample of the patients who completed the questionnaire were also visited immediately after. These check visits always corroborated the patients' counts.

Twenty-eight questionnaires (12 per cent) were not returned. In six of these a good reason such as admission to hospital, absence on holiday, and house move was given. In the remainder no reason could be found and further follow-up was not attempted. Thus 493 patients remained in the survey (table 3).

TABLE 3
DISTRIBUTION OF PRESCRIPTIONS REMAINING IN SURVEY

First prescriptions issued at consultation	266
Repeat prescriptions issued at consultation	133
Repeat prescriptions issued indirectly	94
	493

The two groups of patients, those visited and those having postal questionnaires, were found to have similar characteristics of age, sex, and social class. Similar proportions of patients lived alone.

Compliance was tested for dose and for time. For the former a variation of less than ten per cent in the number of anticipated tablets was accepted as ' good compliance '. Compliance for time was regarded as good if the requisite number of doses was spread evenly over the waking day and other instructions included in the prescription in relation to meals were followed.

Results

The number of patients who were found to comply with both dose and time was 424 (86 per cent); 17 (3·4 per cent) complied with dose only, 19 (3·8 per cent) with time but not dose, and 33 (6·7 per cent) with neither dose nor time (table 4). Of the 69 patients who failed to comply, 43 were discovered by visits and 26 by questionnaire.

There was thus no difference in the percentage of patients failing to comply who were discovered by visiting or who were discovered by questionnaire. It is, of course, possible that all the patients who failed to complete a questionnaire also failed to comply, in which case the number of questionnaire ' failures ' would have risen to 54 and the percentage of compliant patients in this group would have fallen to 77.

TABLE 4
PATIENT COMPLIANCE

	Number	*Per cent*
Patients complying with instructions regarding dose and time	424	*86*
Patients complying only with instructions about dose	17	*3·4*
Patients complying only with instructions about time	19	*3·8*
Patients who did not comply with instructions about either dose or time	33	*6·7*
	493	
Number of questionnaires not returned	28	
Total number of prescriptions originally selected	521	

Comparisons between compliant patients and non-compliant patients revealed no difference in age, sex, or social class in either group.

First prescriptions were less likely to be followed than repeat ones. Thus 20·3 per cent of the 266 patients given first prescriptions failed to comply compared with 8·2 per cent of the 133 patients given repeat prescriptions at consultation and only 4·2 per cent of the 94 patients given repeat prescriptions indirectly.

There was no difference in the proportion of patients receiving the larger numbers of varieties of tablets on prescription in either the group of compliers or non-compliers.

An analysis of the drugs prescribed was made, dividing them into the 14 systems or groups in the *National Formulary*. Table 5 compares the distribution of drugs issued in each of these in the total sample with the distribution of drugs found among the non-compliant proportion of patients.

TABLE 5
NUMBER OF DRUGS PRESCRIBED BY GROUP IN TOTAL SAMPLE AND NON-COMPLIANT SAMPLE

System or group	*Total sample*	*Per cent*	*Non-compliance group*	*Per cent*
Infections	159	*20·0*	37	*28·0*
Nervous system	180	*22·7*	32	*24·0*
Rheumatoid disease	80	*10·0*	19	*14·2*
Cardiovascular	106	*13·4*	10	*7·5*
Respiratory	60	*7·6*	6	*4·5*
Alimentary	58	*6·1*	5	*3·7*
Nutrition and blood	27	*3·3*	5	*3·7*
Ear, nose and throat	13	*1·7*	4	*3·0*
Genital system	32	*4·0*	4	*3·0*
Eye	18	*1·7*	3	*2·2*
Skin	29	*2·5*	3	*2·2*
Metabolism	21	*2·6*	3	*2·0*
Allergic reactions	16	*2·0*	2	*1·5*
Malignant disease	3	*0·4*	0	*0*

Five doctors in the practice were involved in the study. In table 6 the number of prescriptions issued by each doctor is shown as a percentage of the total number of prescriptions issued and compared with the total number of non-compliant patients prescribed for by that doctor.

The percentage of non-compliers among each doctor's patients is also shown. An analysis of the age, sex, social class, and types of drugs prescribed by each doctor does not show any significant variation between one doctor and another except that Doctor A had a larger proportion (28 per cent) of patients older than 61 years than in the whole population surveyed (21 per cent) and Doctor E a larger proportion (19 per cent) of patients under ten years than the whole population (12 per cent).

TABLE 6
COMPARISON OF DIFFERENT DOCTORS

Doctor	*A*	*B*	*C*	*D*	*E*	*Total*
Total number of prescriptions	137	100	87	83	86	493
Per cent of total	*28*	*20*	*18*	*17*	*17*	
Number of non-compliers for each doctor	5	9	17	12	6	69
Per cent of non-compliers for each doctor	*18·2*	*9*	*19·5*	*14·5*	*7*	*14·0*

There were differences in the proportion of first and repeat prescriptions issued by each doctor. These are shown in table 7 and it can be seen that the differences in compliance obtained by each doctor cannot be explained by the different type of prescription. For example, Doctor E had the smallest percentage of non-compliers among his patients, but the largest percentage of first prescriptions.

TABLE 7
PERCENTAGE OF PRESCRIPTIONS ISSUED BY EACH DOCTOR IN VARIOUS CATEGORIES

Doctor	*A*	*B*	*C*	*D*	*E*
First prescriptions	*50*	*44*	*63*	*47*	*64*
Repeat prescriptions	*39*	*37*	*25*	*17*	*9*
Repeat prescriptions issued after telephone call	*10*	*19*	*12*	*36*	*27*

The variations in the total number of prescriptions issued by each doctor and in the type of prescription can be partly explained by the internal organisation of the practice. For example, as each doctor recorded on one day of the week and more consultations were normally done on a Monday, the doctor recording that day would record more prescriptions. On other days the repeat prescriptions were all done by a particular doctor.

Discussion

This study was initiated with the expectation that compliance would be shown to be poor in the group of patients studied and that significant variations might be revealed relating to sociomedical factors.

In the event the compliance of patients was shown to be remarkably high, whether measured subjectively or objectively. Obviously this result might be biased. Certainly all the doctors involved knew they were subject to scrutiny on those particular days even though only a sample of their prescriptions were being investigated. This could account for the very high compliance rate. It is difficult to remove this bias once a system is used that requires the doctor's consent and co-operation.

Limited sampling taking place over a long period should mean that the doctor is less likely to alter his method of working. This survey took a one in ten sample and lasted over a period of six months, but this may account in part for the high compliance rates.

The patients interviewed were unaware until the time of interview that they were under scrutiny and so would have had no time to alter deliberately the residual number of tablets. The results obtained by questionnaire pointed in the same direction. Of course, the findings may be peculiar to the practice studied and in this practice the prescribing rate, and the average cost per patient of each prescription, is below the national average.

In this study some factors previously shown to affect compliance have not appeared to do so. There has been no significant difference in compliance rate in social class groups. It might be that different factors operate in each group to a similar extent. The attitude of patients in social class 5 to pill-taking may be very different from patients in social class 1, but a similar proportion in each group may fail to comply for different reasons.

It did not seem to matter whether patients lived alone. Each patient was asked whether a third party had helped to ensure that the tablets were correctly taken. In about 50 per cent of adults not living alone the answer was ' yes ' and the method described, but the proportion of poor compliers was the same in the ' yes ' group, the ' no ' group, and the patients who lived alone.

Patients were asked whether they adopted some system to help them remember to take their tablets. With first prescriptions only 43 per cent of patients described one, but with repeat prescriptions this rose to over 70 per cent. Methods described were always related to some other fixed habit, for example: " they were kept with my razor ", " I put them with the table napkins ", " I keep them by my lunch box ". This may partly explain the much higher compliance rate with repeat prescriptions than with first prescriptions. People are creatures of habit and this seems to ensure that long-term prescribing is effective. Furthermore, when a patient receives a repeat prescription he has often seen the doctor on a number of occasions and this reinforces the advice given.

Surprisingly it did not seem to matter how many varieties of tablets the patients were taking. Once committed they took them all regularly.

The numbers of prescriptions for each pharmaceutical group are relatively small. It is notable that compliance rates considerably worse than average were found only in two groups of drugs, those given for ' rheumatism ' and those given for infection. On examining the latter it seems to be the adult population who stop taking their antibiotics before they are all gone. Children on tablets complied well, presumably because of parental supervision. Most courses of antibiotics in adults were given for ten days. Most adults gave up after about six.

Drugs acting on the central nervous system might be expected to show poor compliance. Side-effects are common and unpleasant, patients often have mixed feelings about the desirability of drug therapy, and yet others may be using the prescription as a communication line. Even so, the differences between the two groups were small.

During this study a very high compliance rate has been observed which may have been due to alterations in the way in which the doctor-patient transaction occurred. The doctors participating claim to have been unaware of an alteration, so it might be said to have required little additional effort to secure this level of compliance. If this is so, it has important lessons in showing what can be achieved in general practice. It suggests that the important element in prescribing is the relationship between the family doctor and his patient, developed over a number of consultations. It shows that if patients are seen regularly their compliance improves. It may be that hospital prescribing lacks this continuing relationship and that this is the critical factor. Perhaps it indicates that hospital activities should be limited to requesting the family doctor to prescribe and that most drug trials should be conducted through general practice rather than through outpatients.

It also shows that the biggest variable of all in securing compliance is the doctor. Clearly, if we are to improve the effectiveness of our prescribing it would be better to

concentrate upon the doctor end of the doctor-patient link in the consultation. Ley and Spellman (1976) have shown how this can be done.

There is a marked difference between the findings of this report and those of Gatley *et al.* (1968) previously mentioned. This can be explained largely by the fact that the majority of his cases were on short-term treatments, and a high proportion were on antibiotic treatment four times daily, a group which complied least well in this study. He supports the view that patients on long-term therapy were more reliable.

There is no support given to the suggestion that poor compliance has to be accepted in patients. The large numbers of drugs found in patients' homes by interviewers are more likely to be due to doctors prescribing too large quantities, or changing from one drug to another before a course is completed. Good compliance can be secured if prescribing is left to general practitioners who are aware of the importance of their role. A case can be made out for the closer surveillance of patients during their first prescription, particularly those who are on antibiotic therapy.

Acknowledgements

We wish to record our gratitude to the Research Foundation Board of the Royal College of General Practitioners for their generous support for this study, and also to the general practitioners who participated.

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TWENTY YEARS AGO

GROWING POINTS IN MEDICINE AND THEIR RELATION TO GENERAL PRACTITIONERS

MUCH of the work of the College will be connected with the commoner diseases—the 300 or more conditions which an average general practitioner may expect to meet many times during his professional life. . . .

The practitioner with a flair for investigation has a wide choice of subjects. He can play his part in applying modern methods of diagnosis to the conditions he meets in his practice. He can try to improve the arts of prevention and prognosis. He can observe the changes which occur during or after treatment, whatever that treatment may be—with endocrines, antibiotics, operation or radioactive isotopes. He can test new apparatus and new pieces of equipment, new types of material (such as plastic or nylon) or adapt old designs to meet modern requirements. He may play his part in developments in the administrative field—in methods of record-keeping, the planning of practice premises, group practice, nursing or in public health.

Research Newsletter of the College of General Practitioners (1955), **2**, 41.