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COMPLIANCE WITH MEDICATION IN PATIENTS WITH HEART FAILURE IN ZIMBABWE

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ABSTRACT

Objectives: To determine the extent of adherence to prescribed medication in patients with chronic heart failure and to determine to what extent patients recall information given regarding their medication.

Design: Compliance and knowledge of prescribed medication was studied in 22 heart failure patients [mean age 45 ± 4 (range 40-67); 14 (64%) male], using in-depth interviews performed 30 days after having been prescribed medication. All patients received standardised verbal and written information regarding their medication.

Setting: Patients attending four general practices in the private sector (in Harare, Zimbabwe) for at least six months prior to enrolling were included in the study.

Results: Only 12 (55%) patients could correctly name what medication had been prescribed, 11 (50%) were unable to state the prescribed doses and 14 (64%) could not account for when the medication was to be taken, that is to say, at what time of day and when in relation to meals the medication was to be taken. In the overall assessment six (27%) patients were found non-compliant and 16 (73%) patients were considered as possibly being compliant with their prescribed medication.

Conclusions: Non-compliance was common in heart failure patients, as were shortcomings in patients' knowledge regarding prescribed medication, despite efforts to give adequate information. There exists a need for alternative strategies to improve compliance in these patients.

INTRODUCTION

Heart failure is a common disease associated with recurrent hospitalisations and poor prognosis(1,2). A number of clinical trials in heart failure patients have recently shown that the prognosis can be improved by pharmacological treatment(3-5). Compliance, that is to say, adherence to prescribed medication is a prerequisite for participation in clinical trials and is usually controlled. In contrast, in clinical practice compliance to prescribed medication is rarely, if ever, controlled. It is taken for granted that patients follow instructions regarding medication and that they understand the reason they were prescribed medication. However, it is increasingly recognised that non-compliance is common in clinical practice(6). Therefore, the positive effects on mortality and morbidity as reported in clinical trials may, to a large extent, be lost. Indeed, non-compliance has been shown to be related to increased mortality in heart disease(7).

Furthermore, non-compliance and poor recollection of prescribed medication have been shown to be associated with a higher frequency of hospitalisation in older patients(8). Physicians estimations of compliance correlate poorly with the true compliance and they tend to overestimate compliance in their patients(9). Compared to the numerous studies of individual drugs, relatively little information exists on the nature and causes of non-

compliance(10), and there is a definite need to improve our knowledge in this field(11).

The objective of the present study was to determine the degree of non-compliance with prescribed medication in heart failure patients who had received standardised information in accordance with optimal implementation of clinical management guidelines. It was also to determine to what extent heart failure patients could recall the information they had received in conjunction with the prescription of medication.

MATERIALS AND METHODS

Patients with clinically stable heart failure seen by their general practitioners for at least six months prior to enrolling were included in the study. Of the seven private practitioners in central Harare initially asked to participate in this study, four finally agreed to be involved. The practices were chosen on the basis of proximity to the co-ordinating centre (University of Zimbabwe medical school) and access to patients (who would largely be urban based). Private practices were chosen on the assumption that the majority of the patients seen would be financially capable of bearing the costs of therapy prescribed since we did not wish to confound compliance with economic factors that clearly may also adversely affect regularity of medication.

The diagnosis of heart failure was based on characteristic signs and symptoms, objective signs of left ventricular dysfunction

and improvement in symptoms due to heart failure therapy. Patients were excluded if they: (i) were living outside the Harare catchment area; (ii) suffered from psychiatric disease; or (iii) did not consent to be interviewed. Eligible patients were also asked about the ability to comfortably sustain the cost of medication prescribed. If they agreed that all costs could be met, they were then entered into the study. Patients were recruited over the period of September 1999 to December 1999

All patients received strictly standardised information regarding their medication. A special effort was made to ensure that this information was understood by each patient. The information was given by the attending general practitioner (who had already been fully briefed on current guidelines for the management of heart failure) and approximately 30 minutes was spent for this purpose. Patients were told what medication they had been prescribed including the name, preparation, strength, and dose of each drug, and at what time they were to be taken. They were also informed of the reason for the prescription and that they were to discontinue all other previously prescribed heart failure medication. After verbal information the patients received the same information in written form (all patients recruited were literate) by way of a medication chart which also stated the name, preparation and strength of each drug. The doses to be taken at breakfast, lunch-time, evening-meal and bedtime were stated in four columns followed by a last column stating the indication for each drug prescribed. The patients were encouraged to present their medication chart at any further visits to the practice.

A Clinical Pharmacologist, affiliated with the Department of Clinical Pharmacology, interviewed the study patients. The pharmacologist was in no way involved in the treatment of the patients and had no specific knowledge of the patients medical history other than their prescribed medication. Prior to the interview the patients were contacted by the Clinical Pharmacologist to settle the most convenient time for the interview, which took place 30 days after receiving information in conjunction with the prescription of medication. The patients were not informed about the nature or content of the second interview (that they might be asked to recall their medication). Spouses were permitted to be present during the interviews but were asked not to contribute towards the interview. The interviews followed a prespecified protocol. Initially patients were asked to mention what information, verbal and written, they had received regarding their prescribed medication. The patients were asked to show all prescriptions and their medication chart. They were also requested to show all drug packages they possessed, including drugs not mentioned in the medication chart. The patients were then asked to state the names of the prescribed drugs, the reason that the specified medication was prescribed and, the dosage and time for drug intake. If necessary the patients were permitted to consult their medication chart. On the basis of the outcome of the interview the pharmacologist estimated the probability of compliance and the patient was categorised as either compliant or non-compliant. All patients who were able to provide such information regarding their prescribed medication as to make compliance possible, and who stated that they adhered to their prescription, were categorised as compliant.

During the interview the patients were asked about the perceived effects of their medication and any side-effects they were experiencing. In the presence of minor problems the pharmacologist encouraged the patients to discuss them with their general practitioner. In case of any serious problems the practitioner was informed directly. Minor discrepancies between drug intake and the medication chart were not discussed with the patient and no action was taken. If, however, these were serious the patient's practitioner was informed.

RESULTS

Twenty two patients were included in the study. The patients were middle aged (mean age 45 ± 6 ; range 40-67 years) and mentally capable. Fourteen (64%) were male and 13 (59%) were single. Four (18%) patients were receiving aid from the municipal home care services. The cause of heart failure was hypertensive heart disease in 16 (73%) and the mean duration since diagnosis was 43 ± 53 months. The occurrence of concomitant disease is shown in Table 1. The mean New York Heart Association functional class was 2.5 ± 0.9 . The mean number of prescribed drugs was 7.5 ± 3.3 per patient (range 2-16). Further information on the pharmacological treatment is given in Table 2.

Table 1

Concomitant diagnosis occurring in more than 10% of the study patients

	n=22	%
Hypertension	16	73
Atrial fibrillation	6	27
COPD	5	23
Stroke	3	14

COPD = chronic obstructive pulmonary disease.

Table 2

Medication or categories of medication taken by the study patients

Type of drug	n=22	%
Diuretics	21	96
Digoxin	13	59
ACE inhibitors	13	59
Analgesics	8	36
Aspirin	6	27
Warfarin	5	23
Anti-asthmatic	5	23
Calcium antagonists	3	14
Others	12	56

Abbreviations: ACE=angiotensin converting enzyme

Table 3

Patients unable to recall the names of prescribed drugs (name), the prescribed doses (dose) and the time for the drug intake (time), and the number and percentage of patients assessed as being non-compliant.

	no.	%
Name	10	45
Dose	11	50
Time	14	64
Overall non-compliance	6	27

The majority of patients, 20 (91%), remembered receiving verbal information about their medication at discharge or follow-up, whereas only five (23%) remembered receiving any written information in the form

of a medication chart. Two (9%) patients did not recall receiving any information at all. Inability to recall the given information and non-compliance is summarised in Table 3. Ten (45%) patients could not correctly name what drugs they had been prescribed. Eleven (50%) were not able to state the prescribed doses and 14 (64%) could not account for what time of day and when in relation to meals their medication was to be taken. In the overall assessment six (27%) patients were found to be non-compliant and 16 (73%) patients were considered as possibly being compliant with their prescribed medication. All patients who were able to provide such information regarding their prescribed information as to make compliance possible, and who stated that they adhered to their prescription, were categorised as compliant. Still 18 (82%) patients were taking medication not prescribed at the initial consultation or any follow up visit, that is to say, previously prescribed medication that should have been discontinued or new medication prescribed within the last 30 days. The mean number of these medications was 1.9 ± 1.2 per patient.

DISCUSSION

The present study shows that non-compliance with prescribed medication is common in patients with congestive heart failure. Indeed, only three out of four patients were possibly compliant one month after having been given extensive information, according to present standards about their medication. A large number did not adhere to the medication chart that they had received and almost one out of ten patients had completely forgotten the information given. Not only was there an underuse of prescribed medication, but a number of patients were also taking medication that they had been instructed to discontinue. The study confirmed that polypharmacy is frequent in patients with heart failure and the patients included were prescribed an average of seven different drugs.

Compliance may vary depending on diagnosis due to among other things, differences in the degree of symptoms and side effects, and the number of drugs prescribed. In a recent study(12), conducted in a primary care setting and using a method to evaluate compliance similar to that in the present study, Blenkiron found that 77% of patients adhered to prescribed medication. These data are similar to those found in the present study, giving support to the validity of our data.

The information given to the patients in the present study appeared uncomplicated and was reinforced by a medication chart, thus allowing the patient the possibility to refer to it if they were unsure of the verbal instructions. From the point of view of the prescribing physician this approach seems to be an adequate measure to ensure patient compliance and it has been found acceptable in clinical practice. However, Rudd and colleagues(9) have shown that physicians are very poor at assessing to what extent their patients will adhere to prescribed medication and, in the context of the present study, there appears to be

a need for alternative methods to evaluate patient compliance.

As can be inferred from the present study, heart failure patients often continue using medication discontinued and are frequently prescribed new drugs. This has been noted by Burns *et al*(13) in a study of patients discharged from a care of the elderly unit. They found that 48% of patients had previously prescribed medication available at home and only 63% had unchanged prescriptions eight days after discharge. It was suggested that this was in part due to a 'repeat prescription practice' without account being taken of the recent hospital admission. A similar study on changes in medication after discharge showed that differences in medication could be attributed to an incomplete drug history, the continuation of drugs taken before hospital admission and changes not attributable to a conscious clinical decision(14).

Could the extent of non-compliance in the present study be due to the age of our patients? Age has not been found to negatively influence compliance(15). Indeed existing data suggests that compliance rates are higher in older patients compared to younger heart failure patients(16). Polypharmacy has, however, been found to be associated with non-compliance(6). The patients in our study were prescribed a large number of drugs and this may have contributed to a greater extent to non-compliance than the patients' age. The present study does not allow for assessment of the possibility of simplifying patients treatment regimen in order to increase compliance.

There is no true 'gold standard' for measuring compliance. We used in-depth interviews in our evaluation. The interviews were conducted by a pharmacologist who was not directly involved in the treatment of the patients or the prescription of medication, in order to reduce possible bias on the part of the patient. This method has been found more accurate than pill counts for evaluating compliance(17). Interviews are relatively specific in confirming non-compliance but are not sensitive enough to rule it out(18). Compliance in our study may, therefore be over-estimated. Although there is lack of data on compliance in comparable heart failure patients, comparison with studies performed in similar patients suggests that our results are valid and therefore applicable to heart failure patients in general(9,11-13).

In conclusion, we found that non-compliance is common in heart failure patients within an urban setting, as are shortcomings in patients' knowledge regarding prescribed medication despite efforts to adequately provide information. Clearly the study was limited to those patients known to be able to afford their medication. Furthermore, the study does not address the larger problem of adherence to medication in a rural or more indigent setting. However, based on our findings, we believe that there is a need to develop alternative strategies aimed at improving compliance. Such strategies may include simplified medication regimens aimed at reducing polypharmacy, long-term reinforcement, the development of dispensing aids, improved communication between hospital specialists and primary care physicians

and repetitive, objective evaluation of compliance. The effect of such alternative strategies on outcomes in heart failure should then be evaluated.

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REFERENCES

1. Kannel, W.B. and Belanger, A.J. Epidemiology of heart failure. *Amer. Heart J.* 1991; **121**:951-957.
2. Cline, C., Broms, K., Willenheimer, R., Israelsson, B. and Erhardt, L. Hospitalization and health care costs due to congestive heart failure. *Amer. J. Ger. Cardiol.* 1996, **5**:10-23.
3. Consensus Trial Study Group. Effects of enalapril on mortality in severe congestive heart failure. Results of the north Scandinavian enalapril survival study. *N. Engl. J. Med.* 1987; **316**:1429-1435.
4. The Solvd Investigators. Effects of enalapril on survival in patients with reduced left ventricular ejection fractions and congestive heart failure. *N. Engl. J. Med.* 1991; **325**:293-302.
5. Packer, M., Bristow, M.R. and Cohn, J.N. *et al.* for the US Carvedilol Heart Failure Study Group. Effect of carvedilol on morbidity and mortality in chronic heart failure. *N. Engl. J. Med.* 1996, **334**:1349-1355.
6. Nikolaus, T., Kruse, W., Bach, M., Specht-Leible, N., Oster, P. and Schlierf, G. Elderly patients' problems with medication. An in-hospital and follow-up study. *Eur. J. Clin. Pharmacol.* 1996, **49**:255-259.
7. Gallagher, E.J., Viscoli, C.M. and Horwitz, R.I. The relationship of treatment adherence to the risk of death after myocardial infarction in women. *J. Amer. Med. Assoc.* 1993, **270**:742-744.
8. Nananda, C. Fanale, J.E. and Kronholm, P. The role of medication non-compliance and adverse drug- reactions in hospitalizations of the elderly. *Arch. Intern. Med.* 1990, **150**:841-845.
9. Rudd, P., Ramesh, J., Bryant-Kosling, C. and Geurrero, D. Gaps in cardiovascular medication taking: The tip of the iceberg. *J. Gen. Intern. Med.* 1993, **8**:659-666.
10. Haynes, R.B., McKibbon, K.A. and Kannai, R. Systematic review of randomised trials of interventions to assist patients to follow prescriptions for medications. *Lancet.* 1996, **348**:383-386.
11. Wright, E.C. Non-compliance—or how many aunts has Matilda? *Lancet.* 1993, **342**:909-913.
12. Blenkiron, P. The elderly and their medication: understanding and compliance in family practice. *Postgrad. Med. J.* 1996, **72**:671-676.
13. Bums, J.M.A., Sneddon, I., Lovell, M., McLean, A. and Martin, B.J. Patients and their medication: A post-discharge follow-up study. *Age Aging*, 1992, **21**:178-181.
14. Cochrane, R.A., Mandal, A.R., Ledger-Scott, M. and Walker, R. Changes in drug treatment after discharge from hospital in geriatric patients. *Brit. Med. J.* 1992, **305**:694-696.
15. Lorenc, L. and Branthwaite, A. Are older adults less compliant with prescribed medication than younger adults? *Brit. J. Clin. Psychol.* 1993, **32**:485-492. 1
16. Monane, M., Bohn, R.L., Gurwitz, J.H., Glynn, R.J. and Avorn, J. Non-compliance with congestive heart failure therapy in the elderly. *Arch. Intern. Med.* 1994, **154**: 433-437.
17. Fletcher, W., Pappius, E.M. and Harper, S.J. Measurement of medication compliance in a clinical setting. *Arch. Intern. Med.* 1979, **139**:635-638.
18. Sackett, D.L., Haynes, R.B., Guyatt, G. and Tugwell, P. In: Clinical epidemiology. 2nd ed. Boston: Little, Brown, 1991:258-261.