A comparison of hospital and general practice blood pressure readings using a shared-care record card

VERDELLE L. OSBOURNE, AAMS
Research Assistant, Department of Medicine, University of Birmingham

D. G. BEEVERS, MD, MRCP
Senior Lecturer, Department of Medicine, University of Birmingham

SUMMARY. Shared-care blood pressure record cards were issued to 149 consecutive hypertensive patients attending our hospital clinic. In 108 (72.5 per cent), general practitioners entered readings they had obtained onto the cards. The use of the record card has proved helpful in the management of patients, and we are encouraged by the co-operation of the family doctors.

A comparison of blood pressures measured in hospital and in general practice showed that general practitioners found systolic pressures to be an average of 5.5 mm Hg lower than hospital doctors, but there were no differences in diastolic pressure. In many cases, wide discrepancies were found both in hospital and general practice. We conclude that it is a myth that patients' blood pressures are lower when they consult their family doctor, or that outpatient blood pressure readings are falsely elevated by the stress of hospital attendance.

Introduction

MOST hypertensive patients can have blood pressure adequately controlled with relatively few drugs, and are best managed by their family doctor. Only a few with severe or resistant hypertension need attend outpatient clinics, and once their blood pressure is under control, these patients can often be discharged back to general practitioner care. A major disadvantage of referring patients to hospital clinics is that, thereafter, patients may tend to rely on the hospital clinic and cease to consult their own doctor, merely arranging to receive their prescriptions via the receptionist. General practitioners themselves tend to be inhibited from making clinical decisions about such patients, as this might be contrary to the therapeutic policy of the hospital doctors. Communication between hospital doctor and general practitioner must rely on letters dictated at each outpatient visit; these are frequently uninformative or unduly repetitive. To overcome some of these problems we have designed a special blood pressure 'shared-care' record card. It allows general practitioners to continue caring for the patient and makes it possible for relevant information to be passed between the various doctors without generating large numbers of letters and overfilling medical records.

Aims

The purpose of this study was to investigate two points. Firstly, we examined whether patients remembered to carry their card, and whether general practitioners would collaborate in entering blood pressure readings they had obtained. Secondly, we used the readings in the cards to investigate whether there were any systematic differences between blood pressure readings taken in hospital clinics and in general practice. We wanted to see whether there is any truth in the frequently held belief that falsely elevated blood pressure readings are obtained in hospital blood pressure clinics. The co-operation card remains in constant use, but this analysis is confined to our experience in the first nine months of 1979.

Methods

We run a large blood pressure clinic in a city centre hospital which sees about five new patients per week. We issued our special record card to 149 consecutive hypertensive patients. They were asked to show their

Dudley Road Hospital

HYPERTENSION CO-OPERATION CARD

Name..... D.O.B ⌊⌊⌊⌊⌊⌊⌋ (1–6)

Address .....

.....

Hospital No: ⌊⌊⌊⌊⌊⌋ (7–12) Consultant.....

NHS No: ⌊⌊⌊⌊⌊⌊⌊⌊⌊⌊⌊⌊⌋ (13–25)

General Practitioner .....

G.P's Address .....

.....

Keep this card with you at all times.
Show it to your family doctor and hospital doctor.
Bring all your tablets when you visit your doctor.
Never discontinue tablets without consulting a doctor.

Supplied by Stuart Pharmaceuticals Ltd.

DATE							
B.P.	Sitting Lying						
PULSE	Sitting Lying						
B.P.	Standing						
PULSE	Standing						
WEIGHT	kg st lbs						
DRUG 1	(Dose/Day)						
DRUG 2	(Dose/Day)						
DRUG 3	(Dose/Day)						
DRUG 4	(Dose/Day)						
DRUG 5	(Dose/Day)						
DRUG 6	(Dose/Day)						
SERUM UREA							
SERUM POTASSIUM							
OTHER INVESTIGATION							
TIME TO NEXT VISIT							
DOCTOR's SIGNATURE							

Figure 1. *A shared-care record card used in the study.*

cards to their family doctor at every consultation and to carry their cards with them at all times. We routinely send a special covering letter to the family doctors asking them to add any blood pressure readings they have obtained and a note of any changes they may have made in treatment; the card is illustrated in Figure 1.

We compared blood pressure readings only where there had been no intervening change in treatment and where readings were taken within 90 days of each other (average: 20 days). To avoid any 'first visit stress' we analysed only pairs of blood pressure readings taken after the second clinic visit; we included in the study only one pair of readings for each patient. Statistical calculations for coefficient of correlation and paired t-test were performed on a Hewlett-Packard desk computer.

Results

Of the original 149 patients, seven (4.7 per cent) either died, defaulted or were discharged from the clinic. Thirty-four patients (22.8 per cent) returned to the clinic with record cards in which there were no general practitioner readings. Some said they had forgotten to bring their cards, others that their practitioner chose not to enter readings. In 108 patients (72.5 per cent), general practitioners had entered readings and any modification of drug doses they had made.

The results of the comparisons, the mean discrepancies and the coefficient of correlation are shown in Table 1 and in Figures 2, 3 and 4. The average systolic blood pressure obtained in general practice was 5.5 mm Hg lower than that found in the clinic. This difference, while statistically significant, is not clinically important and was no greater than the difference in systolic pressure between two hospital visits. No differences were found in mean diastolic pressures obtained in the two settings. Although average pressures did not differ greatly, there were some alarming discrepancies in both systolic and diastolic pressures: in 18 cases (19 per cent) diastolic pressures differed by 20 mm Hg or more; of these, in 11 the general practitioner reading was lower, and in seven it was higher, than the clinic reading. However, these wide discrepancies between readings in the two settings were no greater than those found when comparing either two general practitioner readings or two hospital clinic readings taken on separate occasions. All doctors at the hospital clinic are instructed to measure pressures carefully, and during this study a special blood pressure nurse was employed. The variability of blood pressure at different visits to the clinic is therefore unlikely to be due to major observer errors.

Discussion

We were pleased that so many patients continued to carry their cards, and that so many general practitioners co-operated.

Although we have not tested this point, we do think that using the card has substantially improved the standard of medical care received by our patients. In

Table 1. Blood pressure readings obtained in the same patients attending both hospital blood pressure clinic and general practice. Figures in brackets represent standard deviations.

	Hospital	General practice	Hospital	Hospital	General practice	General practice
Number of pairs of readings	95		71		41	
Systolic BP (mm Hg)	159.6 (21.8)	165.1 (25.3)	163.5 (30.1)	169.1 (28.6)	156.3 (17.5)	157.1 (23.4)
Mean discrepancy (mm Hg)	5.5		5.6		0.8	
Paired 't'	2.29*		2.16*		2.08	
Coefficient of correlation	0.5114***		0.4907***		0.2496	
Diastolic BP (mm Hg)	98.2 (13.5)	99.5 (14.0)	98.9 (15.1)	101.2 (14.0)	97.9 (9.9)	102.0 (15.6)
Mean discrepancy (mm Hg)	1.3		2.3		3.1	
Paired 't'	0.81		1.23		1.83	
Coefficient of correlation	0.3878***		0.4046***		0.4300**	

*p<0.05 **p<0.01 ***p<0.001

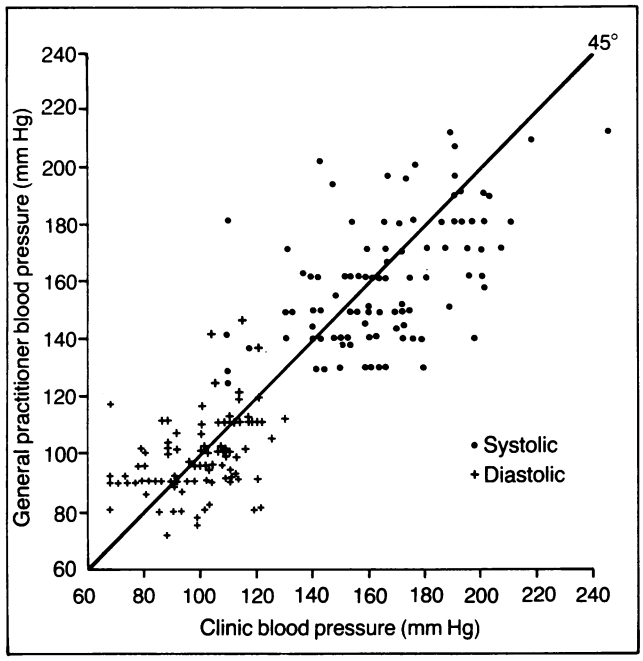

Figure 2. *Comparison of outpatient clinic and general practitioner blood pressure readings, 95 patients, no intervening change in treatment.*

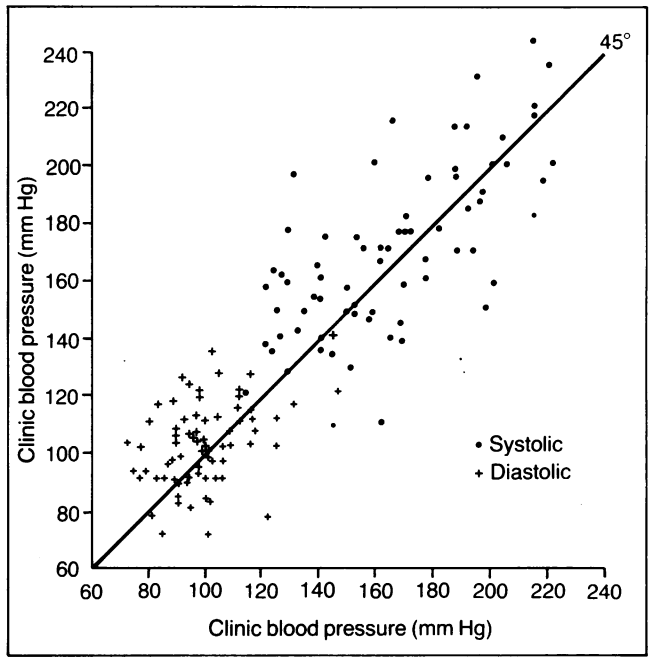

Figure 3. *Comparison of blood pressure readings obtained in hospital outpatient clinic, 71 patients, no intervening change in treatment.*

particular, decisions on changes in drug therapy have been made on the basis of a larger number of blood pressure readings taken in hospital and general practice. Individual non-typical readings could thus be ignored. Ezedum and Kerr (1977) found a similar high degree of compliance on the part of patients in carrying their co-operation cards. In general, when patients are asked to carry record cards or other important medical documents, they do this reliably. In a separate study, we have found that 75.7 per cent of 107 patients on corticosteroids for obstructive airways disease had their steroid card on them at spot checking (Jackson and Beevers, 1980). Similarly Downie and colleagues (1977) found that, when issued, steroid cards are carried reliably. In the case of a blood pressure card, there is a possibility that patients may become unduly anxious and panic when they note individual high blood pressure readings in their cards. We have not tested this possibility as doing so would require an attitude questionnaire, which would be prone to a great deal of bias. However, we can think of no instance where patients have reported worry about their blood pressure readings. It is common practice for obstetric patients to carry a shared-care antenatal co-operation card, and it has been suggested that patients might carry their own general practitioner medical records or a summary of their notes (Metcalfe, 1980).

Our comparison of hospital and general practitioner blood pressure readings has clearly demonstrated that there are no grounds for the contention that family doctors consistently measure blood pressures lower than hospital clinic doctors. Blood pressure readings are

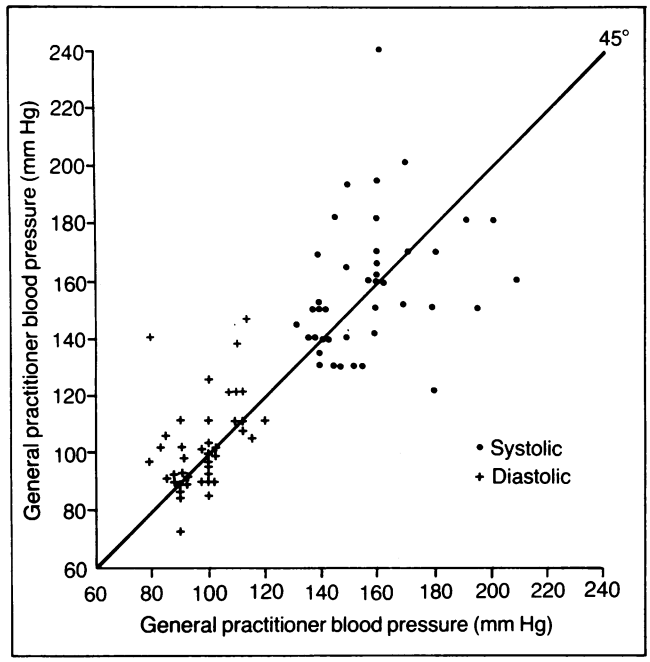

Figure 4. *Comparison of blood pressure readings obtained in general practice, 41 patients, no intervening change in treatment.*

higher during a visit to a doctor than during most other activities of daily life (Littler *et al.*, 1976), and we conclude that general practitioner readings are as unrepresentative as clinic readings. Patients who are taught to measure their own blood pressure at home obtain lower readings (Ibrahim *et al.*, 1977; Laughlin *et al.*, 1980), and these are presumably more comparable with the direct intra-arterial pressures.

The differences in pressures found here cannot be explained by differences in technique in recording diastolic pressure. In our clinic we routinely employ the fifth phase (disappearance of diastolic sounds), and Hodes and colleagues (1975) reported that this is the usual manner of measuring diastolic pressure in general practice. By contrast we have found that, in hospital practice, doctors and nurses more often take diastolic pressures at the fourth phase (muffling of sounds) (Taylor *et al.*, 1979). Our findings are similar to those of Joesbury and colleagues (1976) who, in a joint hospital and general practice clinical trial, found no difference between blood pressure readings in the two settings. We were surprised by the numbers of widely discrepant blood pressure readings and by the poor correlation between pressures taken on two occasions. In a study from Renfrew in Scotland, a similarly low order of correlation was found between pressures from general practice and a screening unit (Barlow *et al.*, 1977). It was not within the brief of this study to investigate whether wide discrepancy in readings obtained in some patients was due to genuine variability of blood pressure or to observer errors.

In this analysis we intentionally did not include pressure recordings taken at the first clinic visit, and all patients were known hypertensives referred to our clinic. However, the difference in systolic blood pressure between the two hospital visits (Figure 3) might be accounted for by the patients becoming more relaxed at successive clinic attendances (Dunne, 1969). This does not, however, explain the hospital/general practice differences found here for, of the 95 pairs of readings analysed (Figure 2), in 55 the general practitioner readings were before the clinic readings and in 45 they were obtained on a later date.

We conclude that it is a myth that general practitioners obtain lower blood pressure readings than hospital clinics, or that hospital clinical readings are less reliable than general practice readings. The occasional anecdotes about the general practitioner obtaining markedly lower readings than the hospital clinic are offset by occasions when the reverse occurs.

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Acknowledgements

We are grateful to Mr J. A. Tweed of Stuart Pharmaceuticals, Cheadle, Cheshire, for the printing of our record cards. This work was supported by a grant from West Midlands Regional Health Authority Research Fund. The study would have been impossible but for the active collaboration of practically all of the general practitioners in the west of Birmingham.

Address for reprints

Dr D. G. Beevers, Department of Medicine, Dudley Road Hospital, Birmingham B18 7QH.