

ment, a separate study was performed to examine the degree of control achieved in 85 patients receiving treatment for hypertension at one of the hospitals.<sup>1</sup> The patients were all those receiving treatment for hypertension among those attending any of nine medical outpatient clinics during one week in December 1972. Their blood-pressure recordings on treatment over the preceding two years (or part of that time) were noted and followed up for the next two-year period. Over the four-year period there were 1272 blood-pressure recordings, of which 758 (60%) were at levels equal to or greater than 100 mm Hg.

### Discussion

Both the general hospitals we studied are in London, one having a long history as a teaching hospital and the other having relatively recently joined the teaching group. They were chosen to see whether there were any differences in their management of hypertension due to different traditions and staff. Few differences were found, suggesting that there might be similar findings in other hospitals.

The study showed that these hospitals were not acting effectively as screening centres for hypertension. Most outpatients escaped without a blood-pressure recording unless they had attended an antenatal or medical clinic. Some outpatients in surgical departments had their blood pressure recorded but usually only when subsequently admitted to hospital (table I). Completing the hospital picture, a separate study of the casualty departments<sup>1</sup> showed that 73% of 155 adult patients who were admitted from casualty had a blood-pressure recording made there but that only 15% of the 962 who were not admitted had one. Thus the opportunity of screening a large proportion of the population for hypertension is being missed, as a recent population survey<sup>2</sup> found that over half of a sample of adults living in the study area had visited hospital in a three-year period.

There have been no comparable studies reported in Britain. In the USA, however, one study<sup>3</sup> found a blood-pressure recording in only 74% of doctors' inpatient notes, another<sup>1</sup> found a recording in 43% of outpatient notes, and a third<sup>3</sup> found 14% of casualty attenders to have a blood-pressure recording in their notes. These figures are similar to our findings, although the proportion of inpatients with a blood-pressure recording in our study was higher. Nevertheless, the coding was designed to include any blood-pressure measurement in the notes, even if it was not performed on admission.

Our study also shows that detection of hypertension often did not lead to further action. The general practitioner was

informed in only 110 cases (71%), and in 34 (22%) the hypertension seems to have been completely ignored. The blood pressure was either found to be normal later or was treated in only 65 (45%) of the hypertensive patients. This compares with an American study<sup>6</sup> which claimed an adequate follow-up of 98% of randomly selected outpatients with a diastolic pressure of 90 mm Hg or more.

Most of the patients whose hypertension was ignored completely had blood-pressure levels close to the cut-off points chosen for this study. There is little doubt about the risks incurred by having a blood-pressure of around 160 mm Hg systolic or 100 mm Hg diastolic,<sup>7</sup> but trials are still in progress to assess the benefits of treatment at these levels.<sup>8</sup> Even among those for whom treatment has definitely been shown to be effective, however, there were patients whose hypertension received no further attention.

Although the degree of blood-pressure control achieved in the patients started on treatment was less than ideal, it conforms with published figures from other hospital series in which between 40% and 60% of unselected hypertensive patients have had their diastolic pressure controlled to 100 mm Hg or below.<sup>9, 10</sup> Comparisons are difficult to make, however, since differences in severity of hypertension between series are directly related to the ease of control on treatment.<sup>1</sup>

This work formed part of an MD thesis by RFH, accepted by London University.

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## Current management of hypertension in general practice

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### Summary

**An examination of the notes of 697 patients in a random sample of seven general practices in one part of inner London showed that 164 (24%) of 669 had had a blood-**

**pressure recording in a five-year period. Proportions varied between 4% and 36% in the different practices. The blood pressure was raised (systolic  $\geq$  160 mm Hg or diastolic  $\geq$  100 mm Hg or both) in 74 patients (45%) whose blood pressure had been recorded, and another recording had subsequently been made in 45 (61%) of these patients. Fifteen (21%) of those with hypertension had not had a blood-pressure recording during the five years before the study. Tranquillisers or sedatives were the commonest drugs used in the treatment of hypertension. As in a study of the management of hypertension in hospital,<sup>1</sup> opportunities provided by visits to the general practitioner were not commonly used for blood-pressure screening, and the discovery of hypertension often did not lead to further action.**

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## Introduction

This study was designed to examine the way hypertension was detected and managed in a random sample of general practices in one part of London. As in a similar study in two hospitals in the same area,<sup>1</sup> the detection, recognition, and treatment of hypertension were separately examined.

## Methods

From a total list of 58 practices serving one area of inner London a random sample of 10 was drawn. The 18 general practitioner principals concerned were asked for permission to study the notes of a sample of the practice. Fifteen doctors in seven practices agreed and a quasi-random (systematic) sample of notes was drawn from the filing cabinets of these practices. Information was abstracted from the notes and included the age and sex of the patient and the number of recent contacts between doctor and patient. A note was made of the highest blood-pressure recording found, whether there had been a follow-up recording, whether treatment for hypertension had been started, and the date of the latest blood-pressure recording.

## Results

The sample comprised 697 patients aged 20 and above, although the age and sex were not known for 68 patients. Of these 629 patients 270 (43%) were men and 129 (20%) were aged 60 or above. There was an entry in the notes denoting contact with the doctor during the year before the study for 332 of 669 patients (50%), 417 out of 632 (66%) had made contact in the three years before the study, and 447 out of 627 (71%) had an entry in the notes in the previous five years. Information was not available for some patients who had not been registered long enough with their general practitioner.

**Detection of hypertension**—A blood-pressure recording was found somewhere in the notes of 164 of 669 patients (24%). Women were more likely to have such a recording than men, and older people more likely than younger (table I). In six of the seven practices the pro-

TABLE I—Blood-pressure (BP) recording according to age and sex in seven general practices

Age (years)	Men		Women		Men and women	
	No	BP recorded(%)	No	BP recorded(%)	No	BP recorded(%)
20-39	157	16 (10)	190	35 (18)	347	51 (15)
40-59	72	16 (22)	81	29 (36)	153	45 (29)
≥60	41	17 (41)	88	47 (53)	129	64 (50)
All ages*	270	49 (18)	359	111 (31)	629	160 (25)

\*Age and sex unknown for 68 patients.

portions of patients with a blood-pressure recording varied from 20% to 36%, and much of this variation could be accounted for by the different age and sex composition of the practices. In one practice, however, recordings of blood pressure were consistently fewer at all ages (4% overall). Of all the notes 94 out of 668 (14%) contained a blood-pressure recording in the three years before the study (excluding one patient, for whom the date was missing), comprising 23% of the 417 patients who had actually made contact during this period. The greater the number of contacts within the three years, the more likely there was to be a blood-pressure recording (ranging from 5% among those with up to three contacts during the three years to 43% among those with 10 or more contacts). The blood pressure was raised (systolic equal to or greater than 160 mm Hg or diastolic equal to or greater than 100 mm Hg or both) at some time in 74 patients with a recording (45%).

**Recognition of hypertension**—A later recording was made after the raised one in 45 of the 74 hypertensive patients (61%), suggesting that the hypertension had been recognised. Blood-pressure recordings which were raised were more likely to be followed by a subsequent recording than those that were not raised, but there was no gradient according to the actual level (table II), nor did the age and sex of the patient appear to make any difference. Fifteen (21%) of 73 hyperten-

TABLE II—Later blood-pressure (BP) recording and treatment according to level of highest BP

Highest BP recording (mm Hg)	No	BP recorded later (%)	Treatment (%)
Systolic:			
<160	104	27 (26)	2 (2)
160-179	27	17 (63)	6 (22)
180-199	14	6 (43)	8 (57)
≥200	19	14 (74)	12 (63)
All ≥160	60	37 (62)	26 (43)
Diastolic:			
<100	108	28 (26)	6 (6)
100-109	28	17 (61)	6 (21)
110-119	13	10 (77)	4 (31)
≥120	15	9 (60)	12 (80)
All ≥100	56	36 (64)	22 (39)
All: systolic ≥160 or diastolic ≥100 or both	74	45 (61)	28 (38)

TABLE III—Time of latest blood-pressure (BP) recording according to level of highest BP

Highest BP recording (mm Hg)	No	Latest BP recording before survey	
		<1 year	≥3 years
Systolic:			
<160	104	24 (23%)	53 (51%)
160-179	27	7 (26%)	16 (59%)
180-199	14	7 (50%)	9 (64%)
≥200	18	10 (56%)	16 (89%)
All ≥160	59	24 (41%)	41 (69%)
Diastolic:			
<100	107	25 (23%)	54 (50%)
100-109	28	8 (29%)	18 (64%)
110-119	13	6 (46%)	8 (61%)
≥120	15	9 (60%)	14 (93%)
All ≥100	56	23 (41%)	40 (71%)
All: systolic ≥160 or diastolic ≥100 or both	73*	29 (40%)	49 (67%)

\*Date of last recording unknown for one patient.

sive patients (date missing for one patient) had not had a blood-pressure recording during the five years before the study, although those with higher levels were more likely to have had a recent blood-pressure recording (table III). Three patients were referred to hospital because of their hypertension.

**Treatment of hypertension**—Twenty-eight (38%) of the hypertensive patients were started on treatment for their condition and 13 appeared to be receiving treatment at the time of the survey. The higher the level, the more likely was treatment to be started (table II), and although older patients were more likely to be treated than younger ones at similar levels of pressure, the differences were not significant. The type of treatment given was recorded for 22 of these patients, 20 of whom were on single drugs and two on combined treatment. Ten patients were receiving a sedative or tranquilliser (eight alone and two in combination with other drugs), seven were on a diuretic (six alone and one in combination) and seven were on other drugs (six alone and one in combination).

## Discussion

Fifteen of the 18 doctors selected at random agreed to allow their patients' notes to be examined, which suggests that these results are likely to be reasonably representative of the general practices of this area as a whole. An opinion survey was also performed of all the local general practitioners about their management of hypertension,<sup>2</sup> and the answers of those selected for our sample did not differ from those of the others. Inner London general practices may differ from those in other parts of the country<sup>3</sup> and we cannot say how far these differences might affect the findings if this survey were repeated elsewhere. One notable difference concerned contact rates between doctor and patient, which were lower than those usually quoted. The

National Morbidity Study<sup>4</sup> found that 60% of those on the practice list made contact with their general practitioner each year compared with the 50% in one year and 66% in three years found in this survey. This discrepancy may be due to the fact that not all contacts are recorded in the notes, as they would be in a special prospective study.

A similar explanation may account for the finding of a blood pressure recording in only 164 (24%) of the notes. Perhaps blood-pressure measurements are not always converted into actual recordings in the notes, and the fact that the blood pressure was raised in 74 (45%) of all patients with a recording suggests that normal blood pressures may not always be recorded. Blood-pressure measurements may also be recorded elsewhere than the practice notes, for example—if taken as part of an insurance or pre-employment medical examination or as part of a visit to an antenatal or family planning clinic. These categories were found in a population survey<sup>5</sup> to account for over 20% of the most recent blood-pressure measurements in men and women respectively. Despite the fact that most women aged between 20 and 39 would be expected to have had a blood-pressure measurement as part of family-planning or antenatal care, there was a blood-pressure recording in the notes of only 35 (18%) of this group (table I). In the population survey<sup>5</sup> 88% of women aged 17-39 reported having had a blood-pressure measurement, but when it had been performed in the course of family-planning or antenatal care the general practitioner had performed the measurement in only 12%. Apparently in this part of London family-planning and antenatal care are performed outside the general-practice setting.

We compared the figure of 24% of notes with a blood-pressure recording with another study from Scotland,<sup>6,7</sup> in which a blood-pressure recording was found in 32-48% of the notes of patients aged 45-64 from three general practices. Another study in Scotland,<sup>8</sup> showed the use of a sphygmomanometer in 9-15% of practice consultations.

That relatively few people have a blood-pressure recording in their general-practice notes may not be too important since it appears that most adults have had their blood pressure measured at some time.<sup>9</sup> Of greater concern is the lack of action taken

when hypertension has been discovered. Whichever criteria are used for defining hypertension, many people in this sample, found by general practitioners to have raised blood pressure, have not received further attention for the condition. In the context of general practice Tudor Hart<sup>9</sup> has adopted Pickering's criteria<sup>10</sup> for hypertension (which are higher than others), and advises treatment in men at diastolic levels of 100 or 105 mm Hg according to age, with women starting 10 mm Hg higher.

As in the study of the management of hypertension in hospital,<sup>1</sup> we have found that people with raised blood-pressure levels have not received treatment, and some do not appear to have had a repeat measurement to see if the elevation has persisted. Furthermore, we were surprised to find that the commonest drugs selected for treatment were sedatives or tranquillisers, since these drugs have never been shown to be effective in the management of hypertension.

This work formed part of an MD thesis by RFH, accepted by London University.

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# Diabetic cardiomyopathy: the preclinical phase

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## Summary

Left ventricular function was assessed by measuring systolic time intervals in insulin-requiring diabetics with and without significant microangiopathy. The results were compared with those in normal controls. Significant microangiopathy was defined as proteinuria over 3 g/24 h or proliferative retinopathy. Left ventricular function was also assessed one and a half years later by echocardiography in four patients with microangiopathy. Patients with angina, previous myocardial infarction,

hypertension, and alcoholism were excluded. All had normal electrocardiograms and chest radiographs. Diabetics with microangiopathy had impaired left ventricular function, whereas those with uncomplicated diabetes had normal function. This finding supports the existence of a specific diabetic cardiomyopathy due to microangiopathy rather than the metabolic defect. The association of microangiopathy and impaired left ventricular function may explain the high immediate mortality and the high incidence of cardiogenic shock and congestive heart failure after myocardial infarction in diabetics.

## Introduction

Recent clinical and epidemiological studies have suggested that diabetics might develop myocardial dysfunction in the absence of large coronary artery disease, hypertension, or valvular disease (diabetic cardiomyopathy). Rubler *et al*<sup>1</sup> reported four patients with diabetic glomerulosclerosis who presented with cardiomegaly and congestive failure of unknown cause. Hamby

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