

# Pilot study of potential barriers to blood pressure control in patients with inadequately controlled hypertension

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**Background.** Most people with high blood pressure (BP) are managed in primary care, but BP control is often inadequate.

**Objectives.** To examine potential barriers to adequate BP control in patients with poorly controlled hypertension.

**Design.** Cross-sectional survey.

**Setting.** Computerized inner city general practice.

**Participants.** A total of 155 hypertensive patients aged 50–80 years with last recorded BP  $\geq$ 150/90 mm Hg (or  $\geq$ 140/85 mm Hg if diabetic).

**Methods.** Patients were invited to attend a nurse-led clinic where BP was measured according to a standardized protocol and patients were asked to complete a semi-structured questionnaire including lifestyle, compliance with treatment and knowledge about hypertension. Details of BP reviews were obtained from medical records.

**Results.** A total of 110 patients (71%) with a mean age of 65 years attended the nurse-led clinic of whom 27% were of African origin. Of those who attended, 52 (47%) had adequately controlled BP when measured according to protocol. The remaining 58 (53%) had inadequately controlled BP. Of patients on treatment, 94% (83/88) reported taking it at least 6 days a week. Only 9% of patients knew their target BP and only 39% that treatment aims to prevent stroke or heart attack. Patients with diabetes were more likely than those without to have BP  $\geq$  audit standard (79% 26/33 versus 42% 32/77,  $P < 0.001$ ).

**Conclusion.** About half of apparently uncontrolled hypertensive patients had BP below target when measured according to standard methods. Reported compliance was good, but patient knowledge of target BP was poor. Patients with diabetes were more likely than those without to have inadequately controlled BP.

**Keywords.** Blood pressure control, primary care, barriers.

## Introduction

Rigorous adherence to blood pressure (BP) treatment guidelines has been shown to improve BP control and reduce cardiovascular mortality<sup>1</sup>. In the UK, most hypertensives are managed in primary care but BP control is often inadequate<sup>2</sup>. This may be due to patient-related, health professional-related or

organizational factors including poor compliance, ‘clinical inertia’—reluctance to change treatment despite failure to achieve target BP and lack of regular review<sup>3,4</sup>. We used data from patient questionnaires, clinical examination and medical records to examine potential barriers to adequate BP control in patients in primary care. As we planned to develop and pilot an intervention to improve BP control, we focused on

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patients with inadequately controlled hypertension according to the medical records.

## Methods

In January–March 2004, we conducted a cross-sectional survey in a multi-ethnic, inner city London general practice with 9000 patients. We performed a computerized search to identify patients on the hypertension register (read code G2 hypertensive disease) aged 50–80 years with last recorded BP  $\geq$  British Hypertension Society (BHS) audit standard in use at that time ( $\geq 150/90$  mm Hg or  $\geq 140/85$  mm Hg if diabetic)<sup>5</sup>. Following exclusions of patients who were housebound or had severe illness, a letter and information sheet were sent asking patients to attend a nurse-led BP clinic at the practice.

Patients who attended were seen by the research nurse (SD) and written informed consent was obtained. BP was measured using the Omron HEM-705CP according to the BHS protocol<sup>5</sup>. This involves measuring BP three times with the patient appropriately positioned, using a suitably sized cuff and averaging the last two readings. Patients were asked to complete a semi-structured questionnaire on demography, medical history, lifestyle, compliance with treatment and knowledge about hypertension.

Statistical analysis was performed using SPSS (version 12.0). We compared characteristics of attenders with non-attenders using chi-square tests. As BP targets are lower for people with diabetes, we compared BP control in those with and without diabetes.

## Results

From the hypertension register ( $n = 356$ ), 225 (63%) patients were identified with a latest recorded BP  $\geq$  audit standard of whom 155 were eligible and invited to take part. The response rate was 71% ( $n = 110$ ). The mean age of responders was 65 years, 27% were Black African or Black Caribbean and 30% had diabetes (Table 1). Baseline characteristics including age, ethnicity and most recent recorded BP were similar in attenders and non-attenders (Table 1).

### *BP control in the clinic*

In the 110 hypertensive patients who attended, mean BP in the clinic was 147/83 (SD 18/10) mm Hg. Nearly half ( $n = 52$ , 47%) had BP below audit standard when measured according to protocol. The remaining 58 (53%) had inadequately controlled BP, of whom 69% (40/58) had had their BP checked in the surgery at least twice in the past year. Patients with diabetes were more likely than those without to have BP  $\geq$  audit standard (79% 26/33 versus 42% 32/77,  $P < 0.001$ ).

### *Compliance with treatment and knowledge about BP*

Twenty-two (20%) patients were not prescribed anti-hypertensive medication. Most patients on treatment ( $n = 83/88$  94%) said they took their anti-hypertensive medication on 6 days per week or more. However, 34 (39%) said they occasionally missed or forgot their medication. This was due to running out of drugs ( $n = 7$ ), being unsure if taken already ( $n = 5$ ), no particular reason ( $n = 5$ ), busy routine ( $n = 4$ ), change of routine ( $n = 4$ ), feeling well ( $n = 4$ ), taking too many drugs ( $n = 2$ ), different moods ( $n = 2$ ), or feeling unwell ( $n = 1$ ). Only 2/88 (2%) patients were not currently taking their prescribed medication. Overall, 9% (10/110) of patients knew their target BP and 39% that treatment aims to prevent stroke or heart attack. Home BP monitoring was performed by 15% of patients.

### *Health care professional and organization ( $n = 110$ )*

Seventy-two (65%) patients had their BP reviewed at least twice in the preceding 12 months by a health professional. Possible barriers to BP control according to the medical records included health professional under-prescribing or feels BP satisfactory despite being persistently above target (47%), BP under review (23%), health professional omitted to recheck BP at subsequent appointments (10%), patient missed BP review (7%), health professional (5%) or practice (5%) did not organize further follow-up, or patient not taking prescribed medication (2%).

## Discussion

### *Principal findings*

About half of apparently uncontrolled hypertensive patients had BP below target when measured according to standard methods. Reported compliance with treatment was high but patient knowledge of target BP was poor. Patients with diabetes were more likely than those without to have inadequately controlled BP.

### *Strengths and weaknesses*

To our knowledge, this is the first UK study examining barriers to BP control in an inner city practice. A quarter of participants were of African origin, a group at increased risk of hypertension and stroke. The study may be relevant to similar populations in other countries. The response rate was high and 100% completion of questionnaires was obtained. The limitations are the size of the study and that we do not know if the improvement in BP control in those who attended the clinic was due to regression to the mean or measuring BP correctly. It is likely that the GPs and practice nurses did not routinely measure BP according to the BHS protocol; however, we were unable to assess this objectively. As we excluded patients with last recorded BP  $<$  audit standard, we

TABLE 1 Characteristics of patients with last-recorded BP  $\geq$  BHS audit standard who did and did not attend the clinic

	Variable	Attended clinic (n = 110), No. (%)	Did not attend clinic (n = 45), <sup>a</sup> No. (%)
Demography	Mean (SD) age (years)	65 (8)	66 (9)
	Male	67 (61)	24 (53)
	Ethnicity		
	White	77 (70)	16 (73) <sup>b</sup>
	Black African or Black Caribbean	30 (27)	5 (23) <sup>b</sup>
	Other	3 (3)	1 (4) <sup>b</sup>
	University degree	28 (25)	
BP from medical records	Mean (SD) systolic BP (mm Hg)	159 (14)	160 (16)
	Mean (SD) diastolic BP (mm Hg)	88 (9)	88 (9)
	Mean (SD) body mass index (kg/m <sup>2</sup> )	29 (10)	
Lifestyle	Current smoker (%)	28 (25)	
	High alcohol intake <sup>c</sup>	13 (12)	
	Adding salt to food or cooking	91 (83)	
Medical history	Mean (SD) hypertension diagnosed (years)	11 (10)	
	Cardiovascular disease <sup>d</sup>	13 (12)	7 (16)
	Diabetes <sup>d</sup>	33 (30)	13 (29)
Medication	No. of prescribed BP medications		
	0	22 (20)	7 (16)
	1–2	61 (55)	23 (51)
	3+	27 (25)	15 (33)
Compliance	Take BP medication $\geq$ 6 days per week <sup>e</sup>	83 (94)	
	Not currently taking prescribed BP medication	2 (2)	
Practice organization	GP manages BP	67 (61)	
	Practice nurse manages BP	38 (34)	
	Hospital manages BP	5 (5)	
	Home BP monitoring	17 (15)	
	No. clinic BP measurements in last 12 months		
	0	14 (13)	6 (13)
	1	24 (22)	8 (18)
2+	72 (65)	31 (69)	
	Follow-up BP check not performed <sup>f</sup>	23 (21)	
	DNA last appointment	8 (7)	
Patient knowledge	Patient knows target BP <sup>g</sup>	10 (9)	
	Patient knows why BP treated <sup>h</sup>	43 (39)	

<sup>a</sup>Questionnaire data not available.

<sup>b</sup>Data available for 22/45 patients only.

<sup>c</sup>>21 (men) or >14 (women) units of alcohol per week.

<sup>d</sup>Taken from practice medical records.

<sup>e</sup>88/110 patients were currently prescribed anti-hypertensive medication.

<sup>f</sup>Due to practice not arranging follow-up or health professional not requesting follow-up or not checking BP at subsequent consultations as planned.

<sup>g</sup>Target BP <140/85 mm Hg, or if diabetic <140/80 mm Hg according to BHS (1999) guidelines.

<sup>h</sup>To prevent stroke and/or heart attack.

did not sample all hypertensive patients. The prevalence of diagnosed hypertension in this practice was below the national average (6% versus 11%). Possible reasons include young population, under-diagnosis or inaccurate register. Finally, we were unable to obtain objective measurements of patient compliance or to assess the attitudes of the GPs and nurses.

#### Implications for clinical practice and research

Researchers planning studies of people with hypertension should be aware that around half of apparently uncontrolled hypertensives may have BP below target when remeasured under research conditions. This may affect sample size calculations. We also found that less than 10% of patients knew their target BP. This should be explained and BP documented at each visit on

patient-held records<sup>2</sup>. Time should be taken to measure BP accurately according to guidelines<sup>6</sup>, and BP persistently above target should be controlled using a step-wise treatment protocol and combination therapy<sup>2</sup>.

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#### Declaration

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Conflicts of interest: None.

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