

Detection and treatment of hypertension in an inner London community

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Heller, R. F. (1976). *British Journal of Preventive and Social Medicine*, **30**, 268-272. **Detection and treatment of hypertension in an inner London community.** A postal survey of a random sample of the population living near St Mary's Hospital, Paddington was taken to determine earlier experience in these people of blood pressure measurement and treatment. Eighty-five per cent of those who could return their questionnaires did so; eighty per cent of the respondents said they had had their blood pressure measured in the past, and 60% reported such a measurement during the previous three years. The respondents aged between 40 and 59 years were invited for a blood pressure screening measurement and 52% responded. Seventy-seven per cent of those found to be hypertensive on screening (systolic ≥ 160 mmHg and/or diastolic ≥ 100 mmHg) said they had had their blood pressure measured during the preceding three years. The reason for the poor control of hypertension in a community, therefore, is more likely to be a failure of doctors to take action on hypertension than a failure to detect it in the first place.

Despite the risks of having a raised blood pressure (Society of Actuaries, 1959; Kannel and Dawber, 1973) and the known benefits of its reduction (Veterans Administration Study Group, 1967, 1970) population surveys have indicated that in most cases hypertension is either untreated or inadequately treated. Five separate studies in the United States of America indicated that between 11% and 23% of the hypertensive population had their blood pressure adequately controlled (Schoenberger *et al.*, 1972; Wilber, 1973; Henderson *et al.*, 1974). Unpublished data from a large trial of coronary heart disease among middle-aged men in industry in the UK (WHO Collaborative Group, 1974) suggest that only 7% of the hypertensive population is adequately controlled to below 100 mmHg diastolic. This increases to 29% when control is defined as a diastolic pressure on treatment of less than 110 mmHg. As part of an attempt to find the reasons for this poor control, a postal survey was undertaken to ask members of a random sample of the general population if they had had their blood pressure measured in the past. If few members of a population had had a blood pressure measurement the reason

for the poor control would be a failure of detection of hypertension. If the majority had had their blood pressure measured then the reason for poor control would be a failure of action on detected hypertension, and this would be of importance in planning corrective measures.

As an additional part of the study a screening survey (among respondents to the postal questionnaire) was performed to assess the part it could play in detecting hypertension in the community.

METHODS

POSTAL SURVEY

A questionnaire was sent by post to a sample of the population living in the catchment area of St Mary's Hospital, Paddington. A 1.5% random sample was drawn from the Electoral Register, identifying 1143 adults. In addition to the questionnaire each subject received an explanatory letter and a stamped addressed envelope. The questionnaire included the question 'Have you ever had your blood pressure measured?' If the answer was positive the subjects were asked to state when, by whom, and if

they had ever been told they had a raised blood pressure and been given treatment for it. A diagram was drawn on the form in case there should be any doubt about what a blood pressure measurement was. The subjects were also asked what medical contact they had had during the previous three years. Those who had not replied after 12 days were sent a reminder letter which included a copy of the original letter and questionnaire and another stamped addressed envelope. Those who still had not replied after 29 days were similarly sent a second reminder.

SCREENING SURVEY

The subjects aged between 40 and 59 years who had returned a questionnaire were placed at random into one of two groups. Those in the first group were asked to visit their general practitioner, and those in the second to come to St Mary's Hospital for a blood pressure measurement. A letter was written to each person explaining the need for blood pressure screening, the letters differing only in the instructions of where to go. Those who were asked to visit their general practitioner had a letter to give him asking him to measure the blood pressure and send the result to the author in an enclosed stamped addressed envelope. If no reply was received after four weeks a reminder letter was posted to the subject. Those asked to come to the hospital were sent an appointment card with a specified time (but with a wide choice if this time was not convenient) and a map of the Epidemiology Department where the measurements were to take place. Those who did not attend were sent a second letter. Blood pressures were measured (by the author) using a Hawksley random zero machine. Those whose initial pressure was ≥ 160 mmHg systolic and/or ≥ 100 mmHg diastolic had a second reading, and if the mean was at or above these cut-off points the subject was told his blood pressure was slightly raised and asked if he wanted his general practitioner to be informed. If he did, he was asked to see his general practitioner

who would in the meantime have received an explanatory letter. Three months later the general practitioners were asked if the person had visited and whether treatment had started.

Any subject who had shown anxiety about hypertension on the questionnaire was excluded before randomization which was performed on 264 of the original respondents. Of these 133 were referred to their general practitioner and 131 asked to attend St Mary's Hospital. The answers to the questionnaires showed that randomization had produced similar groups in all respects except that the hospital subjects comprised relatively more males.

RESULTS

POSTAL SURVEY

THE RESPONSE Completed questionnaires were received from 861 people, 75% of the total (crude response rate) and 85% of those who could have replied (corrected response rate). Of the 1143 forms, 127 were returned either by the Post Office or by other people living at the addresses to which the letters had been sent, stating that the subject had moved, died, or was too ill to reply. It appeared that the first reminder letter had boosted the response but that the second letter had had little effect. A follow-up of a sample of one-in-four of the people from whom nothing had been heard showed that 42% did not reply because they had died, were ill, or had changed their address.

ANSWERS TO THE QUESTIONNAIRE Sixty per cent of all the respondents stated that they had had their blood pressure measured during the previous three years, and as many as 80% (690 of the 861 respondents) reported a blood pressure measurement at some time in the past. Table I shows that women were more likely to report a blood pressure measurement than men. Of the 690 respondents who recalled a previous blood pressure measurement the most recent measurement had been made at a

TABLE I
PROPORTION REPORTING A BLOOD PRESSURE MEASUREMENT (POSTAL QUESTIONNAIRE)

Age (Years)	Men		Women		Both Sexes	
	No.	%	No.	%	No.	%
17-39	154	69	171	88	325	79
40-59	113	73	162	91	275	84
60+	99	77	140	81	239	79
All ages	366	72	473	87	839*	81

*Age/sex unknown in 22 subjects.

hospital in 51%, at a general practitioner's surgery in 36%, and at work in 3% (the remainder being made up by 6% 'elsewhere' and 4% who did not remember). Insurance or pre-employment medical examinations accounted for 21% of the recent measurements in men as did antenatal or family planning visits in 24% of the women.

Sixteen per cent of the respondents had been told at some time that their blood pressure was raised, 7% had received treatment, and 3% were currently on treatment for a raised blood pressure. Older people were more likely to report knowledge of and treatment for hypertension (Table II). Of those on treatment for hypertension at the time of the survey 68% were aged 60 or more.

TABLE II
REPORTED KNOWLEDGE OF AND TREATMENT FOR HYPERTENSION (POSTAL QUESTIONNAIRE)

Age (Years)	No.	Raised Blood Pressure		
		% Ever Told	% Ever Treated	% On Treatment
17-39	325	13	4	1
40-59	276	17	5	2
60+	239	19	13	8
All ages	840*	16	7	3

*Age unknown for 21 subjects.

Only 18% of the respondents said they had had no medical contact in the previous three years. Altogether 73% stated that they had made contact with their general practitioner, 48% had visited a hospital outpatient or casualty department, and 26% had been hospital inpatients during the previous three years.

QUESTIONNAIRE VALIDATION Studies performed to validate the answers to the questionnaire included comparison with answers at subsequent interview (during screening), a study of duplicate replies, and a separate study in which identical questionnaires were posted and the replies compared with information previously recorded from general practice notes. These indicated that three of the questions might have produced underestimates. The proportion of the population with an earlier blood pressure measurement was more likely to be 86% than 80%, the proportion on treatment for a raised blood pressure 4% instead of 3%, and the proportion

who had visited their general practitioner in the previous three years as high as 92% instead of the 76% in the main study.

SCREENING SURVEY

RESPONSE TO THE SCREENING INVITATION The overall response rate was 52%. Altogether 72 of the 133 (54%) responded to the request to visit their general practitioner and 65 of the 131 (50%) responded to the hospital invitation.

Those who had responded early to the questionnaire were more likely to come for screening as were those who indicated on their questionnaires that they had had medical contact in the previous three years (Table III). Factors such as age, sex, or previous experience of blood pressure measurement and treatment made no difference to the tendency to come for screening, either to hospital or a general practitioner.

TABLE III
MEDICAL CONTACT IN THREE YEARS OF THOSE SCREENED AND THOSE INVITED BUT NOT SCREENED

Medical Contact in Three Years*	Came for Screening % (No. = 137)	Invited but Not Screened % (No. = 127)
General practitioner	78	66**
Hospital		
Outpatient or casualty department	54	39**
Inpatient	23	24
No medical contact	10	28**

*According to answers to postal questionnaire.

**Differences between screened and not screened significant $P < 0.05$. Figures are percentages of number in each column.

HYPERTENSION Of the 137 people screened, 31 were hypertensive (defined as systolic ≥ 160 mmHg and/or diastolic ≥ 100 mmHg on the first reading). The prevalence of hypertension was the same in men and women and although both systolic and diastolic pressures were higher when measured in hospital than by the general practitioner the differences were not significant. (Of the 31 hypertensive subjects, 15 came from the general practice and 16 from the hospital side of the screening survey.)

The questionnaire replies (Table IV) showed that of those found to be hypertensive, 77% said they had had their blood pressure measured during the previous three years. This is significantly more than the 49% of the normotensives who reported such a measurement ($P < 0.05$). Of the hypertensive subjects 42% said they had been told before that their blood pressure was raised.

Twelve people from the hospital screening were referred to their general practitioner because of

TABLE IV
EARLIER BLOOD PRESSURE EXPERIENCE* ACCORDING TO BLOOD PRESSURE ON SCREENING

Screening	No.	Blood Pressure				
		Measured in Past (%)	Measured in 3 Years (%)	Ever Told Raised (%)	Ever on Treatment (%)	Now on Treatment (%)
Hypertensive** on screening	31	87	77	42	16	10
Normotensive on screening	106	86	49	14	1	—
Not screened	127	83	53	16	7	2
Total invited for screening	264	85	54	18	6	2

*According to answers to postal questionnaire.

**Systolic \geq 160 mmHg and/or diastolic \geq 100 mmHg.

hypertension. By three months, seven of the 12 had been to see their general practitioner—two were already on treatment and three were started on treatment as a result of the visit. So of 10 'new' hypertensives five visited and three began treatment.

DISCUSSION

The response rate to the postal survey was encouraging and together with the validation studies suggests that this is a good way of obtaining medical information in this part of London. The finding that at least 80% of a general population sample have had their blood pressure measured in the past, 60% in the previous three years, is information which does not seem to have been obtained before in this country. This suggests that most of the hypertension in the community is known about and that a failure of detection is not the main cause for its poor control. The results of the screening survey re-emphasize this point in that 77% of those found to be hypertensive reported a blood pressure measurement during the previous three years. (A Canadian Survey (Sackett, 1975 personal communication) similarly found that 71% of the discovered hypertensives had had a blood pressure measurement during the preceding two years.) In fact, only 42% of those hypertensive at screening had previously been told that they had a raised blood pressure. It is unlikely that the hypertension had developed since the last measurement (Kannel and Dawber, 1973), but possible that the screening level was higher than before due to the considerable variability of blood pressure (*vide infra*). It appears more likely that the subjects had, for one reason or another, not been previously informed of a raised measurement. Most of those hypertensive on screening, even if they had previously been told of a raised blood pressure, had not been treated (the validation studies implying only a small underestimate in answer to the question about such treatment).

Table IV shows that, conversely, some subjects who were normotensive on screening had previously been told that their blood pressure was raised. The use of a single examination to classify a subject as 'hypertensive' or 'normotensive' was studied by Armitage *et al.* (1966) who found that this could produce more than one-third false positives and 5% false negatives due to the considerable within-subject variability of blood pressure. The subjects in the current survey who said they had previously been told that they were hypertensive but who fell below the screening cut-off point may fall into the false negative group mentioned by Armitage, or the information may have been based on different criteria to define hypertension. It does not appear that anti-hypertensive treatment was being given to these people and, although the question was difficult to validate, it has at least some accuracy since a greater proportion of those hypertensive on screening said they had been told of hypertension in the past than those found to be normotensive.

The response to the request for screening was disappointing with only half of those contacted actually attending. Large scale population screening for hypertension has been found to produce much larger response rates—even up to 95% (Miall and Chinn, 1974). Methods have included widespread publicity to encourage group response and home visiting. Wilber *et al.* (1972) found that home visiting produced a better response than an invitation to a hospital or health centre. Hypertension screening surveys in which general practitioners have written to their own patients to invite them for screening have also produced high response rates of 75% and 86% (Adler and Marson, 1973; Coope, 1974). The current survey could not match the response rates produced by these other methods, and the people who did attend tended to have had recent medical contact in any case.

The final yield of the hospital part of the screening survey was that three people were treated out of 131 invited for screening (no attempt was made to assess whether those screened by the general practitioners were started on treatment). While this was a lower yield than anticipated it means that the screening process was probably worthwhile. However, two of these three subjects who were started on treatment had had a blood pressure measurement during the preceding three years and the other had been told her blood pressure was raised 10 years earlier.

CONCLUSIONS

The screening survey performed in this study produced an unsatisfactory response and would have been largely unnecessary if adequate action had been taken on the hypertension that must previously have been detected. Screening surveys, however, remain necessary to detect the hypertension of the few people who do not otherwise make medical contact (if ways can be found to attract them to the screening process). For most people, however, screening during routine medical contact would be sufficient for detection—and this is apparently happening now since so many of the postal survey respondents reported having had their blood pressure measured. The problem appears to lie in persuading doctors to start treatment on the hypertension they detect. Doctor education programmes have been suggested in the USA (Stokes, Payne, and Cooper, 1973; Cheitlin, 1974) and if appropriate guidelines could be devised these might prove a valuable way of improving the control of hypertension in the community.

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