PAPERS AND ORIGINALS

Blood-pressure screening and supervision in general practice

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British Medical Journal, 1979, **1**, 843-846

Summary and conclusions

Since April 1975 all men aged 35-69 years registered with four general practices in west central Scotland have had their blood pressure checked whenever they visit the surgery. Although the practice locations range from rural to city centre and observers comprise receptionists, nurses, and doctors, a standard procedure has been adopted for the examination, recording, follow-up, and management of high blood pressure.

The results confirm that raised blood pressure is common and often goes undetected. Even when hypertension is known, casual blood pressure readings often exceed accepted normal levels. The findings also show that a population may be routinely examined through normal contact with the family doctor, and that this can provide a convenient, acceptable, and effective means of detecting and reducing raised blood pressure.

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Introduction

The joint working party of the Royal College of Physicians of London and the British Cardiac Society on the Prevention of Coronary Heart Disease[1] considered that the prevalence of cardiovascular disease was such that the cost of inactivity was greater than the cost of prevention. The working party recommended that the blood pressure of every adult should be recorded whenever they visit a doctor for consultation. With even moderately raised levels the coronary risk factors of smoking, diet, and inactivity assume increased importance, and although the treatment of hypertension may not prevent coronary heart disease, it does reduce the risk of heart failure, renal failure, and stroke.[2 3]

Anticipating these developments, the Working Party on Functional Integration of Patient Care in Hypertension, representing the Royal College of General Practitioners, the Royal College of Physicians, Edinburgh, the Royal College of Physicians and Surgeons of Glasgow, and the faculty of community medicine of the University of Glasgow, designed a procedure for the detection, follow-up, and management of hypertension. To test the method a study[4] was established in four general practices in west central Scotland; we report the progress at the end of three years.

Materials and methods

Since April 1975 men aged 35-69 years on the age-sex registers of four general practices in west central Scotland have had their blood pressure recorded routinely whenever they visit the surgery. The practices range from rural in Callander and semi-rural in Bridge of Allan to suburban and city centre in Glasgow and include both health centre and group surgery-based practices. An urban practice in Falkirk began the study later than the others and has not completed three years.

Blood pressure is recorded by a receptionist, nurse, health visitor, or doctor, varying with the practice and from time to time. To ensure comparability between practices the diagnostic procedure is standardised by initial and periodic calibration of practice sphygmomanometers and training, testing, and retesting non-medical observers with a standard timed series of tape-recorded Korotkoff sounds.[5] Readings

TABLE I—*Outcome of screening and follow-up in four practice areas over three years*

	Rural	Semi-rural	City estate	City centre	Total
No of doctors participating	2	2			6
No of patients registered	3000	4850	3100	2900	13850
No of men aged 35-69 years	600	900	750	700	2950
No (%) examined	520 (86·7)	608 (67·6)	615 (82·0)	544 (77·7)	2287 (77·5)
No (%) recalled	50 (8·3)	83 (9·2)	95 (13·0)	82 (12·0)	310 (10·5)
No (%) re-examined	44 (7·3)	58 (6·4)	69 (9·2)	60 (8·6)	231 (7·8)
No (%) of cases confirmed	35 (5·8)	37 (4·1)	39 (5·2)	42 (6·0)	153 (5·2)
No (%) of new cases	10 (1·7)	18 (2·0)	15 (2·0)	16 (2·3)	59 (2·0)
Examination rate over three years (%)	86·7	67·6	82·0	77·7	77·5
Recall rate for follow-up (%)	9·6	13·7	15·4	15·0	13·6
Response rate to follow-up (%)	88·0	69·9	72·6	73·2	74·5
Detection rate (confirmed at follow-up) (%)	6·7	6·1	6·3	7·7	6·7
% of known cases	4·8	3·1	3·9	4·8	4·1
% of new cases	1·9	3·0	2·4	2·9	2·6

are taken normally on the right arm with the patient seated and rested, and phase V diastolic pressure is recorded at the point of disappearance of sounds.

Criteria for the definition and management of hypertension were established in the preliminary stages of the study (see appendix I). Threshold diastolic pressures of 95, 100, and 105 mm Hg were agreed for the age groups 35-39 years, 40-59 years, and 60-69 years respectively, and a pressure at or over the threshold limit is taken as an indication for early review and subsequent investigation and treatment if confirmed. Each patient's readings, treatment, and examination findings are entered on an individual standard record card designed to facilitate a uniform pattern of care in the four practices[4] (see appendix II).

Results

Table I shows the outcome of routine blood pressure measurement in the four practice areas. The six participating doctors had a total of 13 850 patients, of whom 2950 (21·3%) were men aged 35-69 years and therefore eligible for the study.

Over the three years 2287 (77·5%) of the eligible men were examined, 310 (13·6%) of them being recalled. Of these, 231 (74·5%) attended for follow-up examination, at which 153 (66·2%) were confirmed as hypertensive; 59 of these patients (38·6%) were new cases. Thus the overall detection rate of hypertension (among examinees) was 6·7%, 4·1% being known cases and 2·6% new cases (table I).

Table II summarises the yearly progress of the study. Both the proportion of the eligible population examined and the proportion of cases confirmed were highest in the first year, but the proportion of new cases detected increased as the study proceeded.

Table III gives the age distribution of new and known cases of hypertension. A similar age distribution occurred throughout the practices, the majority of patients being in the 40-59-year age group and most of the remainder in the 60-69-year age group. In each practice the proportion of known cases was higher in the older age groups.

Table IV lists the changes in mean blood pressure levels in the men with confirmed hypertension between those recorded initially and the most recent follow-up readings. Overall, the mean systolic pressure fell from 173 to 155 mm Hg and the mean diastolic pressure from 109 to 100 mm Hg.

TABLE II—*Yearly progress of study in all practices combined*

	Year of study			Total
	First	Second	Third	
No of men aged 35-69 years	2950	2950	2950	2950
No (%) examined	1191 (40·4)	686 (23·3)	410 (13·9)	2287 (77·5)
No (%) confirmed cases	94 (7·9)	41 (6·0)	18 (4·4)	153 (6·7)
No (%) new cases	26 (27·7)	20 (48·8)	13 (72·2)	59 (38·6)

Discussion

Although the four study practices differ in setting and organisation, their findings were in good agreement overall and comparable to those of other community studies on hypertension. Over the three years the average examination rate was 78%, which is consistent with other estimates of consulting in general practice[6 7] and compares favourably with response rates in large-scale epidemiological surveys.[8–10] Direct comparison with other populations is difficult because of differences in age structure and diagnostic criteria, but the detection rate of hypertension, with 13·6% of examinees recalled and 6·7% of confirmed cases, was similar to that in other surveys in west central Scotland.[8–10] The proportion of new cases varied from practice to practice but was on average lower than sometimes

TABLE III—*Age distribution of men with confirmed hypertension in four practice areas (new and known cases)*

		Rural		Semi-rural		City estate		City centre		Total		
		New	Known	New	Known	New	Known	New	Known	New	Known	All (%)
Age (years)	35-39	1	2	1			3	1		3	5	8 (5·2)
	40-59	8	13	14	11	12	15	14	18	48	57	105 (68·6)
	60-69	1	10	3	8	3	6	1	8	8	32	40 (26·1)
	Total	10	25	18	19	15	24	16	26	59	94	153 (100·0)
Ratio of new to known cases		0·4:1		0·95:1		0·63:1		0·62:1		0·63:1		

TABLE IV—*Change in mean blood pressures (mm Hg) in men with confirmed hypertension in four practice areas*

	Rural		Semi-rural		City estate		City centre		Total	
	Systolic	Diastolic	Systolic	Diastolic	Systolic	Diastolic	Systolic	Diastolic	Systolic	Diastolic
Initial pressure	169	109	175	108	168	108	178	112	173	109
Final pressure	149	98	158	100	155	100	157	103	155	100
Difference	−20	−11	−17	−8	−13	−8	−21	−9	−18	−9

quoted,[11 12] when subjects with any previously recorded hypertensive reading were classified as known cases. In patients aged under 60, however, the ratio of new to known cases approached 1 to 1.

A total of 40% of the eligible population attended in the first year, 23% in the second year, and 14% in the third year, which suggests a uniform consulting rate of 40% a year for men in this age range and implies that just under half of this group can be seen in one year, nearly two-thirds over two years, and that after three years almost four-fifths will have attended.

The proportion of examinees confirmed as hypertensive declined over the three years, suggesting that sustained hypertension is associated with more frequent consulting and therefore earlier presentation. Known cases, as regular attenders, probably accounted for the higher initial yield of confirmed cases, and this is borne out by the increasing proportion of new cases over the period. The age distribution of confirmed cases was similar in the four practices and the proportions of known cases in the oldest age group were high. This probably reflects the increasing prevalence of raised blood pressure with age, although any tendency for older patients to consult more frequently, or for doctors to check their blood pressure more readily, would also contribute to the preponderance of known hypertensives aged 60 and over.

The most rural practice had the highest examination rate and lowest recall rate, the smallest loss on follow-up, and the largest proportion of known cases. The semi-rural practice, on the other hand, had the lowest examination rate and lowest proportion of known cases. The city areas had a higher proportion of men in the study age range, and "transient" raised blood pressure—that is, not sustained on follow-up—appeared most often in the housing estate, while confirmed hypertension was greatest in the city centre. Differences between the practices were small, however, in relation to the general consistency of their findings and were as likely to reflect observer and operational variation as any real difference between rural, urban, and city populations.

The overall results identify the chief epidemiological characteristics of hypertension—namely, that it is a common condition (6·7% of examinees) which, being asymptomatic,[13 14] often goes undetected (2·6% of examinees) or uncontrolled (4·1% of examinees).

Given the obvious interest and commitment of the doctors participating, this study supports the *feasibility* of screening and supervising hypertension in general practice by the successful incorporation of the procedures into the normal routine of consultations. The *acceptability* to patients is affirmed not only by the high response rate for follow-up examination but also by the fact that only one out of 2288 patients refused a blood pressure check. The high yield of cases for relatively small cost in time and resources is a measure of the *efficiency* of integrating blood pressure screening with primary care, while the *effectiveness* of medical supervision of hypertension is shown by the sustained reduction in blood pressure levels with follow-up and treatment. The average falls of 18 mm Hg systolic and 9 mm Hg diastolic compare favourably with the mean reductions achieved in treated subjects in the Medical Research Council's current multicentre study on mild to moderate hypertension.[15] The absolute levels of both systolic and diastolic pressures were higher than in the MRC blood pressure study, which is, of course, confined to mild to moderate increases (90-109 mm Hg) in a slightly younger population. Clearly there is scope for achieving a further reduction in the blood pressure of confirmed hypertensives to levels nearer "normal," but whether this is a question of drug efficacy, patient compliance, or medical supervision remains to be answered, as does the full extent of the benefit likely to accrue from better control of hypertension.

We conclude that the screening and supervision of raised blood pressure has its proper place in general medical practice rather than in special health surveys, which may be less effective, particularly in follow-up, and are much more costly.[16] Development of this already valuable potential of primary care may gain further impetus when current investigation[15] has measured the

Appendices

APPENDIX I—*Criteria for definition of hypertension and procedure for follow-up and management*

Definition of hypertension	Management
Men aged 35-39 years	
Mild (diastolic pressure 95-109 mm Hg):	
Abnormalities present	Refer
Abnormalities not present	Correct smoking and weight. Prescribe salt restriction plus sedative
Diastolic pressure falls below 90 mm Hg	Review at 6 months
Diastolic pressure persists	Treat
Diastolic pressure rises (>5 mm Hg)	Refer
Moderate (diastolic pressure 110-129 mm Hg)	Refer
Severe (diastolic pressure ≥130 mm Hg)	Refer urgently
Men aged 40-59 years	
Mild (diastolic pressure 100-114 mm Hg):	
Abnormalities present	Consult or refer
Abnormalities not present	Review at 6 months
Diastolic pressure rises (>5 mm Hg)	Treat
Moderate (diastolic pressure 115-129 mm Hg):	
Abnormalities present	Refer
Abnormalities not present	Treat
Severe (diastolic pressure ≥130 mm Hg)	Refer
Men aged 60-69 years	
Mild (diastolic pressure 105-114 mm Hg):	
Abnormalities present	Refer
Abnormalities not present	Review yearly
Diastolic pressure rises (>5 mm Hg) / Symptoms of decompensation	Consult or refer
Moderate (diastolic pressure 115-129 mm Hg):	
Abnormalities present	Consult or refer
Abnormalities not present	Treat
Severe (diastolic pressure ≥130 mm Hg)	Refer

APPENDIX II—Record card completed for each patient with hypertension.

(I)

SURNAME PRE-NAMES

ADDRESS D. of B.

G.P. Name .....
Address .....
.....

RELEVANT FAMILY HISTORY

RELEVANT CO-EXISTING DIAGNOSES

CARDIOVASCULAR SYMPTOMS AND SIGNS

SMOKING HABITS

Cigs: Yes/No (No. daily =) Pipe: Yes/No
Cigars: Yes/No

INITIAL INVESTIGATIONS Date

Height _____ ft.) Patient's
Weight _____ lbs.) estimates

Urine protein _____
sugar _____

Heart _____

Fundi _____

E.C.G. _____

Chest X-ray

HOSPITAL PHYSICIAN Unit No.

(II)

HYPERTENSION COMBINED CARE RECORD
OBJECTIVE - DIASTOLIC mmHg.

Date	Blood Pressure				K_+	Therapy	Comments
	Sitting		Standing				
	Code	mmHg.	Code	mmHg.			

benefit of treating even mild to moderate increases (90-109 mm Hg) in diastolic pressure.

The cost of overhauling equipment and collecting and compiling results was supported by a grant from the Glasgow and West of Scotland Group of the Chest, Heart, and Stroke Association. The members of the study group are grateful to the Royal College of Physicians, Edinburgh, and the Royal College of Physicians and Surgeons of Glasgow for accommodating their meetings, and to Mrs Margaret Dick and the staff of the practices for their help. Professor V M Hawthorne convened the study group.

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(*Accepted 5 February 1979*)

Value of cytology for detecting endometrial abnormalities in climacteric women receiving hormone replacement therapy

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British Medical Journal, 1979, **1**, 846-848

Summary and conclusions

Over six months 113 endometrial specimens from 110 menopausal women receiving hormone replacement therapy were examined by two cytologists and two histopathologists. Specimens were obtained by aspiration with the Isaacs cell sampler immediately before Vabra suction curettage, both procedures being performed in the outpatient department without anaesthetic. The histologists agreed with each other on the classification of 85 specimens (75·2%) and the cytologists agreed on the classification of 44 (38·9%). In only 15 cases (13·3%) did all four observers agree. Of the three cases of cystic or adenomatous hyperplasia detected histologically, only one was diagnosed by cytology. Furthermore, both cases of adenocarcinoma escaped detection by cytology, though a third case—later confirmed—was suspected by one cytologist alone.

Use of the Isaacs endometrial cell sampler cannot be advocated for routine screening of women with climacteric symptoms receiving hormone replacement therapy. Efforts should be made to establish the correct dose and duration of treatment with an oestrogen-progestogen preparation in order to avoid over-stimulating the endometrium and the need for regular screening for endometrial abnormalities.

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Introduction

The widespread use of oestrogens for treating climacteric symptoms is restricted by the fear of endometrial carcinoma and the lack of a simple, painless method of monitoring endometrial changes. Regular histological examination of the endometrium has been advocated, which would necessitate a simple outpatient screening procedure. Formal dilatation and curettage under general anaesthesia is logistically impossible, and Vabra suction curettage may cause discomfort and fail to produce a satisfactory specimen in 18% of patients taking oestrogens.[1] Hutton *et al*[2] obtained satisfactory specimens in 90% of cases using the Isaacs cell sampler in routine gynaecological patients and suggested that the technique would be useful for screening postmenopausal women. We have evaluated this claim.

Patients and methods

Over six months beginning in February 1978, 113 endometrial specimens were collected by aspiration with the Isaacs cell sampler from 110 menopausal women receiving various regimens of hormone replacement therapy. The technique was used immediately before Vabra suction curettage. Both procedures were performed in the outpatient department without anaesthetic. A bivalve speculum was inserted into the vagina and a single-toothed tenaculum applied to the anterior lip of the cervix. The assembled sampler was then introduced through the cervical os until the fundus was reached. After pushing the cervical stop against the cervix the plunger of the syringe was withdrawn to create a vacuum and the intrauterine cannula rotated into each cornu to obtain samples from the whole uterine cavity. The