

Management of High Blood Pressure in General Practice

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In spite of proposals for screening, the general practitioner remains the most important individual in detecting patients with high blood pressure¹⁻³ and, moreover, the general practitioner is the one best suited for the continuing care of the hypertensive patient. As recent controlled studies⁴⁻⁶ indicate that effective treatment of mild and moderate hypertension improves prognosis, it is likely that more people with mild to moderate elevation of blood pressure will receive drug treatment in the future.

This study was undertaken to determine the approach of general practitioners to the measurement, investigation and treatment of high blood pressure.

Methods

A multiple choice questionnaire containing 24 questions was designed to investigate the management of high blood pressure by general practitioners. In particular, information was sought on the measurement of blood pressure, drug treatment, investigation and follow-up. The doctors were asked their county of practice, and the year in which they qualified. Reply paid envelopes were included for return of the completed questionnaires. The responses were analysed by digital (diabol) computer. Chi-squared analysis was used to detect statistically significant differences between the various age groups of doctors.

Results

Questionnaires were posted to 1,381 practising general practitioners in the country, and completed questionnaires were received from 702 (51%). Forty-six doctors were qualified less than five years, 204 were qualified 6-10 years, 131 for 11-20 years and 321 qualified over 20 years ago. As few

doctors qualified less than five years are in general practice, this group was included with the 5-10 years group for statistical analysis.

Measurement (Table 1): Blood pressure was routinely measured in patients with unrelated problems by 85% of doctors when the patient was aged over 20 years. However, only

14% of doctors did so when the patient was under 20 years of age. Sixty-six per cent made 3 or more blood pressure readings, carried out over a number of weeks, before diagnosing hypertension. However, 12% were prepared to make a diagnosis at one consultation. Sixty-two per cent of doctors took blood pressure sitting, and either arm was used equally often. Twenty-four

Table 1
Measurement of Blood Pressure

Question	Answer	% Doctors
When patients consult you with problems other than hypertension, do you routinely check BP?	Patient aged 1-20 years	14
	21-50 years	85
	over 50 years	93
How many readings would you normally take before diagnosing a patient as hypertensive?	one	4
	two	29
	three or more	66
Over what period would you take the above readings?	one clinic consultation	12
	several readings over one week	23
	several readings over number of weeks	64
In what position would you routinely measure blood pressure?	patient lying	4
	patient standing	9
	patient sitting	62
	patient lying and standing	24
In which arm do you routinely measure BP?	left arm	25
	right arm	23
	both arms	16
	no preference	34
What auscultatory phase do you use for measurement of BP?	Korotkoff phase 4	25
	Korotkoff phase 5	74
What type of sphygmomanometer do you use?	mercury	29
	aneroid	32
	automatic	1
	more than one	36
Do you have your sphygmomanometer serviced?	mercury serviced	16
	aneroid serviced	16
	both serviced	13
	no service	56

per cent took blood pressure both lying and standing and 16% measured the pressure in both arms.

Threequarters of the respondents used Korotkoff phase 5 as the diastolic endpoint, with 25% taking phase 4. Aneroid and mercury sphygmomanometers were used about equally with 36% using more than one sphygmomanometer. Over half (56%) do not have their sphygmomanometer serviced.

Case Investigation: When investigation is considered necessary, 62% of general practitioners refer patients directly to hospital, while the remainder arrange their own investigations. There was a significant difference between the various age groups in this respect. The majority of older doctors, 58% of those over 11 years qualified and 74% of those over 20 years qualified, referred the patient to a hospital consultant, whereas the majority of doctors qualified within the last 10 years arranged investigations themselves.

Investigations carried out included urinalysis (77%), urea and electrolytes (56%), serum creatinine (31%), serum urate (24%), cholesterol and triglycerides (51%), chest X-Ray (65%), ECG (50%), IVP (25%) and catecholamines (7%). Younger doctors performed these investigations more often than older doctors and this difference reached statistical significance in the case of urea and electrolytes ($p < 0.001$), serum creatinine ($p < 0.01$), chest X-Ray ($p < 0.02$), ECG ($p < 0.01$) and IVP ($p < 0.001$).

Follow-up: Eighty-four per cent were not in favour of home recording as an aid to management. Rejection of home recording was more prevalent among doctors qualified over 20 years, only 9% being in favour. In contrast, 20% of doctors qualified less than 20 years approved of home recording ($p < 0.05$).

Sixty-one per cent favoured combined follow-up management between

hospital and general practitioner, with **36% preferring to have sole charge.**

Levels of Blood Pressure Treated (Table 2): The level of blood pressure at which treatment is prescribed varied with the age of the patient. For patients aged 20-40 years, most doctors treated patients with a diastolic blood pressure in the range 90-100 mmHg. Forty-one per cent treated this level of blood pressure in patients aged 41-60 years and, when the patient was aged over 60 years, 16% of doctors did so. There was a significant difference (χ^2 , $p < 0.02$) between older and younger doctors in this respect, with 20% of doctors qualified over 20 years treating elderly patients with blood pressure of this level, while only 10.7% of younger doctors did so. In the presence of normal diastolic blood pressure, the level of systolic blood pressure at which treatment commenced again increased with patient age. Sixty-four per cent of doctors treated patients under 60 years of age with systolic blood pressure of 150-190 mmHg, while 37% treated this level of isolated systolic hypertension in patients over 60 years.

Choice of Drugs (Table 3)

A diuretic, usually a thiazide, was the drug of first choice (67%) for mild hypertension. However, 18% of doctors did not prescribe specific antihypertensive therapy for mild hypertension, some prescribing no drug and others, particularly older doctors, prescribing sedatives. In moderate hypertension (diastolic blood pressure, 106-120 mmHg) beta adrenoreceptor blocking drugs were used by 30% of doctors and diuretics by 32%, while methyl-dopa was used in 18% of cases. In severe hypertension (diastolic blood pressure > 120 mmHg), the beta adrenoreceptor blocking drugs were used by 46%, methyl-dopa by 20% and diuretics by 11%. The diuretic group was used by 30% of doctors in the treatment of isolated systolic hyper-

tension (diastolic blood pressure < 90 mmHg, systolic > 160 mmHg); 21% used sedatives, 13% used beta blockers, 7% used methyl-dopa and 4% used reserpine.

Choice of drug varied with the time the doctor had qualified. In general, younger doctors were more likely than older doctors to prescribe beta adrenoreceptor blocking drugs. This difference was significant for both moderate ($p < 0.001$) and severe hypertension ($p < 0.05$). Conversely, doctors over 11 years qualified were more likely to prescribe methyl-dopa ($p < 0.001$) and those over 20 years qualified more often chose reserpine ($p < 0.001$) for moderate hypertension than did younger doctors. Similar trends were apparent with these two drugs in mild and severe hypertension but the differences were not statistically significant. When more than one drug was necessary, the most commonly used combination was a beta adrenoreceptor blocking drug, with a diuretic, followed by a diuretic with methyl-dopa. Other combinations were rarely used. Older and younger doctors again differed in their choice of drug combinations. Eighty per cent of younger doctors chose beta adrenoreceptor blocking drugs with diuretics, while only 57% of those over 20 years qualified did so, and the combination of methyl-dopa with a diuretic was chosen by 15% of younger but 35% of older doctors.

The most commonly prescribed diuretic was bendrofluazide (49%), followed by chlorothalidone (13%), amiloride + thiazide (12%), metolazone (7%) and frusemide (6%). Potassium supplements were routinely used along with diuretics by 67% of doctors. Fifty-eight per cent prescribed the diuretic and potassium as a combination product, while 18% preferred separate medications. The preference for separate tablets increased as the doctors' age increased.

The age of the doctor did not influence the choice of beta-blocker. Propranolol was most often prescribed (35%), followed by metoprolol (27%), oxprenolol (10%), atenolol (7%), acebutalol (3%) and timolol combined with a diuretic (10%). Forty-four per cent expressed a preference for a cardioselective beta-blocker, 11% for a non-cardioselective type, and 44% had no preference.

Discussion

One of the main disadvantages associated with mailed surveys is the difficulty in obtaining the high response necessary to reduce the possibility of non-response bias⁷. The response rate in the present study, 51%, was relatively low, but perhaps predictably so

Table 2
Level of Blood Pressure Treated

Question	Level of BP	% doctors prescribing for patients in each age group		
		20-40 yrs.	41-60 yrs.	>60 yrs.
At what diastolic BP level do you prescribe treatment in the absence of symptoms?	<90 mmHg	5	1	0
	90-100 mmHg	72	41	16
	101-110 mmHg	20	52	53
	111-120 mmHg	1	4	26
	>120 mmHg	0	0	2
In the presence of normal diastolic pressure, at what systolic BP level do you prescribe treatment in the absence of complications?	<150 mmHg	12	3	0
	151-190 mmHg	76	64	37
	191-230 mmHg	11	31	55
	231-260 mmHg	0	0	6

Table 3
Choice of Drugs

Drug	Mild (diastolic 90-105 mmHg)	Moderate (diastolic 106-120 mmHg)	Severe (diastolic >120 mmHg)	Systolic (diastolic <90 mmHg; systolic >160 mmHg)
No drug	11	1	3	15
Diuretic	67	32	11	30
Methyldopa	2	18	20	7
Beta adrenoreceptor blocking drugs	2	30	46	13
Vasodilator	0	0	5	0
Adrenergic neurone blocker	1	3	4	2
Indapamide	1	4	0	1
Clonidine	0	1	1	1
Reserpine	3	6	2	4
Sedative	7	0	0	21

because the questionnaire was long and complicated. Interpretation of the results must take this into account. Since those circulated had been guaranteed anonymity, it was not possible to send reminders or to sample the non-respondents. Nevertheless, the response represents half the general practitioners in the country, and the distribution by county and by age closely corresponds with that for the family doctor population.

Awareness of the importance of detecting hypertensive patients was high, as evidenced by the fact that the majority of doctors stated that they measure blood pressure routinely in all patients over 20 years. This contrasts with earlier results in England and Wales in 1975⁸ when only 11% routinely checked blood pressure even in the middle-aged. However, it was uncommon even in the present study for doctors to measure the blood pressure of those aged under 20 years of age presenting with problems other than hypertension.

Most doctors conformed to recommended practice by taking several blood pressure measurements before diagnosing hypertension. It is likely that the 12% who diagnose hypertension at one clinic visit, or after one blood pressure reading, may misdiagnose hypertension as many patients with raised blood pressure on initial examination become normotensive on subsequent examination⁹. Greater accuracy in the measurement of blood pressure could also be achieved by the measurement of the pressure in both arms at least at an initial evaluation, as many patients have a difference of 10 mmHg or more between both arms¹⁰. Only 16% of doctors, in fact, did this.

A properly working sphygmomanometer is essential for the accurate diagnosis of hypertension. Mercury sphygmomanometers need cleaning and checking every year and an aneroid instrument should be checked against a mercury manometer every six months¹¹. The aneroid manometer, which is considered less accurate than the mercury¹¹, was used with almost equal frequency. It is likely that many sphygmomanometers are defective and, therefore, need repair as 56% of instruments are not serviced and have been in use for several years.

The predominant use of Korotkoff phase 5 as the diastolic end point contrasted with earlier findings in Scotland¹² when 43% of general practitioners used phase 4, 29% used phase 5 and 28% used both. Our findings may reflect different practice within two countries, or, more likely, increasing use of phase 5 in recent years, and are more in keeping with

practice in England and Wales⁸, where phase 5 was used more often than phase 4, but the difference was less marked than in the present study. Both these previous studies showed that more recently qualified doctors were more likely to use phase 5 than were older practitioners. The present survey revealed no age-related difference between doctors in this respect.

Significant difference emerged when the attitude of the various age groups of doctors towards investigation of hypertension were considered. Not only were younger doctors more likely than older doctors to arrange investigation themselves, but the frequency with which each individual test was carried out decreased as the doctors' age increased. While it was common in the past for a large battery of tests to be carried out on newly diagnosed hypertensive patients, the wisdom of routinely carrying out all of these investigations has been questioned in recent years¹³⁻¹⁶. Of particular interest was the relatively high percentage of doctors arranging intravenous pyelography for their patients. This is a costly procedure which has been shown not to significantly alter patient management when used routinely in hypertension¹⁵. The fact that there was a preference for a chest X-Ray rather than an ECG was a feature of other studies^{3,12}, and may be due to the general practitioners' difficulty in obtaining a reported ECG.

Doctors were reluctant to allow their hypertensive patients to be treated solely by either hospital out-patient departments or specialised blood pressure clinics, though two-thirds felt that the hospital had a role in a continued care system. This probably represents the optimum system of care which permits the patient to benefit from the diagnostic facilities of the hospital and continuing

advice in patients whose blood pressure is difficult to control.

Home recording of blood pressure is an accurate technique that facilitates diagnosis and management of hypertension, is acceptable to patients and may reduce the amount of medical supervision required¹⁷⁻¹⁹. The usual objections are that it may cause anxiety to patients, and that patients may not be able to carry out measurements reliably. The fact that 20% of younger doctors thought home recording a good idea may signal increasing acceptance of the practice.

Despite evidence that patients of all ages benefit from treatment of even mild hypertension^{5,6,20}, there was some reluctance to treat until the diastolic blood pressure exceeded 100 mmHg. There is no clear evidence that treatment of isolated systolic hypertension is of value, and it is, therefore, not surprising that many doctors do not treat it. This reluctance is further emphasised by the fact that the drug of first choice for treatment of systolic hypertension was frequently a sedative.

Drug treatment in general seemed appropriate, the majority of doctors (67%) prescribing diuretics for mild hypertension, with increasing use of beta adrenoreceptor blocking drugs as the severity of hypertension increased. Methyldopa is widely used, particularly by older doctors, who prescribe this drug in preference to beta adrenoreceptor blocking drugs for patients with moderate hypertension. Seven per cent prescribed sedatives for mild hypertension, but specific antihypertensive therapy was almost always used for moderate and severe hypertension. It is not possible to explain the attitude of the small number of doctors who do not prescribe any drug even for severe hypertension.

Potassium supplements were

routinely prescribed for patients taking diuretic drugs by 67% of doctors. This may in part be due to the popularity of products containing both potassium and a diuretic. However, recent recommendations indicate that routine prophylaxis against diuretic-induced hypokalaemia may be unnecessary²¹ and in the future will probably be reserved for patients at risk.

In conclusion, while there were some differences between older and younger doctors in the management of high blood pressure, the majority of doctors from all age groups appeared to be aware of the importance of high blood pressure and treated patients according to recommended procedures. They considered that these patients should be cared for principally in the general practice environment, though the majority preferred to maintain some contact with the hospital. Predictably, opinion varied on the levels of blood pressure at which to prescribe, drugs of first choice and the extent of work-up necessary, but this confusion reflects in large part the present state of knowledge. Hopefully, as research continues on these aspects of high blood pressure, precise guidelines will be available in the not too distant future.

Summary

A postal survey was carried out to determine current practice of general practitioners in Southern Ireland in the management of patients with high blood pressure. Questionnaires were sent to 1,381 doctors and completed

forms were returned by 702 (51%). Questions related to the measurement of blood pressure, drug treatment, investigation and follow-up. Responses were considered in relation to the number of years the doctor had been qualified. The major points of note were an awareness of the importance of detecting high blood pressure (85%); a realisation of the importance of repeated measurements before making a diagnosis (66%); a preference for combined hospital-general practice management (61%); rejection of home recording of blood pressure (84%) especially among older doctors (91%); a tendency, particularly among younger doctors, to perform a number of investigations; a preference for Korotkoff phase 5 for diastolic measurement (74%) and poor maintenance of sphygmomanometers (56%). Choice of drugs varied, depending on the level of blood pressure and the age of the doctor, and 67% routinely used potassium supplements in combination with diuretics. It was concluded that, among the respondents, practice in hypertension is generally satisfactory.

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Book Review

THE HARRIET LANE HANDBOOK. Ninth Edition; pp. 316.

The subtitle of this book is "A Manual for Paediatric House Officers". This reviewer was surprised to learn that the handbook has already reached its ninth edition. In the foreword, the authors draw attention to the areas of intense revision, namely the formulary, the sections relating to cardiology, metabolic disease, developmental assessment, radiology and haematology. The layout of the book is easy to follow, and the section on a formulary is most comprehensive and wisely includes the generic names of drugs as well as trade names. The chart relating to drugs excreted in breast milk has advice that not everyone would agree with, namely that breastfeeding is contra-indicated

where the mother is on Ampicillin or Valium (amongst other drugs).

Typical of the extraordinary detail of this book is exemplified in the section on Radiology relating to a possible case of Meckel's diverticulum where the advice is given to carry out a technetium pertechnetate study prior to a barium meal study, lest the latter should give rise to confusing "hot spots".

In this section also reference is made to C.T. scanning as an excellent means of identifying intracranial haemorrhage and, while this is true, nevertheless it should be borne in mind that the procedure requires moving an infant who is often in a precarious state with regard to maintenance of ventilation, perfusion and temperature. It is

surprising, therefore, that ultrasound scanning with portable machines is not even mentioned.

Overall, the ninth edition is a worthy successor to its predecessors. For the Paediatric House Officer or Registrar, it is a fund a information and worthy of a place in his or her white coat pocket! Also, it can be confidently stated that, with this handy reference close at hand, patient management and care presents less difficulties than might otherwise be the case.

As publishers like to note errata, there is a misprint on page 225 under 1.(A): "Assure" is printed instead of "Ensure".

E. Tempny.