

THE MENTAKAB HYPERTENSION STUDY PROJECT PART VI - BLOOD PRESSURE MEASUREMENT AND HYPERTENSION : A QUESTIONNAIRE SURVEY OF MEDICAL STAFF

T O Lim

ABSTRACT

A questionnaire concerning various aspects of blood pressure measurement and hypertension was answered by 84 out of 98 (86%) doctors and 73 out of 100 (73%) nurses working in various parts of the state of Pahang. 59% and 85% of doctors and nurses respectively agreed that blood pressure should be measured routinely in all out-patients. 48% of medical staff were taught to use and 38% were actually using phase 4 as the diastolic blood pressure despite the general agreement that phase 5 should be used to denote diastolic pressure. 52% of doctors believed that hypertensive patients present with symptoms, the common symptoms cited were headache and dizziness, although it is well documented that hypertension is essentially asymptomatic. 93%, 80%, 69% and 82% of doctors believed that treatment of hypertension can prevent cerebrovascular disease, heart failure, renal failure and coronary artery disease respectively, although prevention of the last complication is yet unproven. Most doctors would begin treating a patient at rather low level of blood pressure, for example, for a man in the age group 40 - 49, 40% of doctors would begin drug treatment at diastolic pressure of 90 mmHg and 55% at diastolic pressure 95 mmHg. 79% of nurses and 55% of doctors were dissatisfied with the sphygmomanometer they have, the most common complaint was that the cuff-bladder 'blow up' on being inflated.

Keywords : Hypertension, blood pressure measurement, phase 4, phase 5 diastolic pressure, hypertensive symptoms, mild hypertension, sphygmomanometer.

SINGAPORE MED J 1992; Vol 33: 160-163

INTRODUCTION

Hypertension is probably the commonest medical condition in this country. Most, if not, all members of the health profession have experience of dealing with hypertension and all appreciate the importance of blood pressure recording. Their views on blood pressure measurement and actual practice will be useful in understanding how they intervene in the hypertensive patient.

A questionnaire survey was conducted on a sample of doctors and nurses to gauge their views on blood pressure measurement and various aspects of hypertension.

MATERIALS AND METHODS

The study population of doctors comprised those working in two health districts in the state of Pahang. These two health districts were served by 2 large but non-teaching hospitals. At the time of sampling, the two districts had 51 doctors in private general practice, 72 hospital medical officers (excluding house officers) and 23 government clinic medical officers, giving a total of 146 non-specialist doctors. Using stratified random sampling, 35 doctors were selected from the general practitioner sub-group, 18 from government clinic medical officers and 45 from hospital medical officers, giving a sample of 98 doctors. House officers were deemed insufficiently experienced and they were excluded from the survey. The 98 doctors sampled were either given the questionnaire directly or were sent

the questionnaire by post. Efforts were made by personal contact or reminder to achieve better response rate.

The study population of nurses comprised those working in 2 government hospitals in 2 health districts in Pahang. There were a total of 418 nurses of various grades. No formal sampling was carried out. Fifty questionnaires were sent to each of the 2 hospitals. They were given to nursing staff working in medical wards, surgical wards and out-patient departments.

The questions asked in the survey are given below in the result section. There were 11 questions for doctors and adequate space for comment. The questionnaires sent to the nurses were shorter and included only questions 1,4,5,7 and 10. Each questionnaire was accompanied by a letter which explained the purpose of the survey, informed study subjects that they may leave any particular question unanswered if they so wish and each subject was assured of the confidentiality of his or her response. No name was requested nor was the questionnaire marked or numbered.

We received replies to the questionnaire from 84 doctors and 73 nurses. Of the doctors who responded, 44 were hospital medical officers, 16 were government clinic medical officers and 24 were general practitioners. Of the nurses who responded, 2 were sisters, 42 staff nurses, 14 assistant nurses, and 15 did not state their position. The overall response rate of doctors was 86% and the nurses 73%.

RESULTS

An analysis was made of the 84 replies from doctors and 73 replies from nurses:

Questions :

- (1) *Do you consider that blood pressure should be measured in all patients above the age 30 regardless of complaint?*

Table I gives the result of the number and percentage of medical staff who agreed that blood pressure should be measured routinely in all in-patients and out-patients. Doctors were less enthusiastic than nurses to measure blood pressure in out-patients.

Hospital Daerah Mentakab
28400 Mentakab
Pahang, Malaysia

T O Lim, MBCHB (Glas), MRCP (UK)
Physician

Correspondence to : Dr T O Lim
Clinical Specialist
Jabatan Nefrologi
Hospital Besar Jalan Pahang
50586 Kuala Lumpur
Malaysia

Table I – Response of medical staff to questions one, three and seven.

Questions	Doctors n = 84		Nurses n = 73	
	Yes No. (%)	No No. (%)	Yes No. (%)	No No. (%)
(1) Agreed that blood pressure should be measured in :				
(a) all in-patients	78 (93)	6 (7)	59 (81)	14 (19)
(b) all out-patients	50 (59)	34 (41)	62 (85)	11 (15)
(3) Believed in hypertensive symptoms	44 (52)	40 (48)	–	–
(7) Believed treatment can prevent:				
(a) Ischaemic heart disease	69 (82)	15 (18)	71 (97)	2 (3)
(b) Stroke	78 (93)	6 (7)	71 (97)	2 (3)
(c) Heart failure	67 (80)	17 (20)	68 (93)	5 (7)
(d) Renal failure	58 (69)	26 (31)	69 (94)	4 (6)

- (2) *Do you measure the blood pressure of middle-aged patients (40-60 years) whom you see at your clinic?*
52 (62%) doctors said they always measure the blood pressure of middle-aged patients, another 30 (36%) said they did so sometimes.
- (3) *Do you believe that hypertensive patients usually present with symptoms?*
This belief was held by 44 (52%) doctors (Table I). Those who believed were asked to tick what they thought were the three most common presenting symptoms. The percentages opting for each symptom were as follows: Headache (95%), dizziness (91%), tiredness (30%), pain (21%), insomnia (17%) and dyspnoea (13%).
- (4) *When you measure diastolic blood pressure, do you use diastolic phase 4 (muffling of sounds) or diastolic phase 5 (disappearance of sounds) or both?*
25 (30%) doctors used phase 4, 47 (56%) used phase 5 and 12 (14%) used both. Considerably more nurses (48%) were using phase 4 than doctors and another 47% of nurses were using phase 5 (Table II).
- (5) *Were you taught to use phase 4 or phase 5?*
Considerably more doctors (46%) were taught to use phase 4 diastolic blood pressure than they were actually using (30%). Nevertheless, the proportion of medical staff taught to use phase 4 were substantial (48%), and therefore 38% of them were actually doing so (Table II).

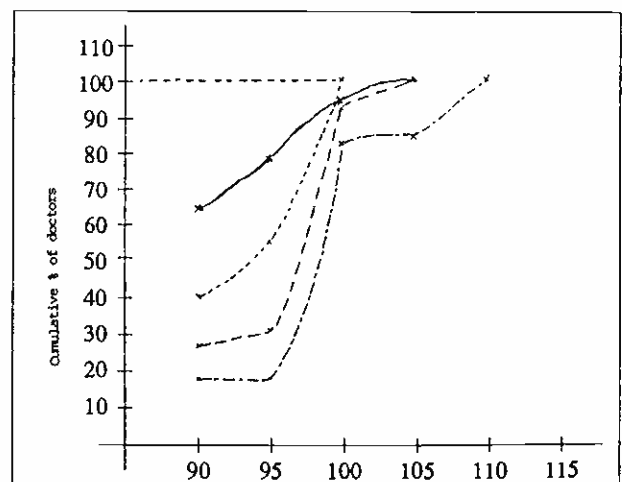
- tassium (77%), electrocardiography (71%), chest x-ray (70%) and serum cholesterol (42%).
- (7) *Do you believe that treatment of hypertension may prevent ischaemic heart disease, stroke, heart failure or renal failure?*
As shown in Table I, 93% of the doctors believed that stroke could be prevented, 82% ischaemic heart disease, 80% heart failure and 69% renal failure. 97% of nurses believed that both stroke and ischaemic heart disease could be prevented by treatment of hypertension, 94% renal failure and 93% heart failure.
- (8) *Please indicate at what level of blood pressure you would begin drug treatment of patients with hypertension? (various age groups were given).*
The response to this question were plotted as cumulative frequency curves in figures 1a & b. For both systolic and diastolic blood pressure, younger patients were treated at lower levels of blood pressure, for example 64% of doctors would start drug treatment for a patient in the age group 20 to 39 at diastolic pressure 90 mmHg whereas only 28% of doctors would start drug treatment for a

Table II – Number (Percentage in Bracket) of Medical Staff who used and were taught to use phase 4 and phase 5 diastolic blood pressure readings.

Staff	Method used (n = 156)			Method taught (n = 152)		
	Phase 4 No. (%)	Phase 5 No. (%)	Both No. (%)	Phase 4 No. (%)	Phase 5 No. (%)	Both No. (%)
Doctors (n = 84)	25 (30)	47 (56)	12 (14)	39 (46)	37 (44)	4 (5)
Nurses (n = 72)	35 (48)	34 (47)	3 (4)	34 (47)	38 (53)	0 (0)
Total	60 (38)	81 (52)	15 (10)	73 (48)	75 (49)	4 (3)

- (6) *Before commencing patient on treatment for hypertension, what investigation would you sometimes order?*
Overall, 91% of the doctors would sometimes investigate their hypertensive patients. The percentages of doctor choosing any particular investigation were as follows: Urine examination (92%), blood urea (92%), serum po-

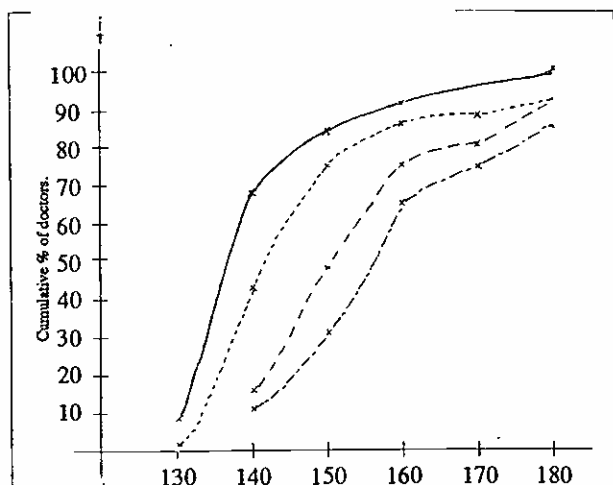
Fig 1a – Cumulative percentage of doctors who would begin treatment at various levels of diastolic blood pressure



Diastolic blood pressure level at which drug treatment was started (mmHg).

- Age 20 – 39
- - - - - Age 40 – 49
- Age 50 – 59
- . - . - Age ≥ 60

Fig 1b – Cumulative percentage of doctors who would begin treatment at various levels of systolic blood pressure.



Systolic blood pressure level at which drug treatment was started (mmHg).

- Age 20 – 39
- Age 40 – 49
- Age 50 – 59
- Age ≥ 60

patient in the age group 50 to 59 at similar level of diastolic pressure. Similarly, at systolic blood pressure of 140 mmHg, 70% of doctors would start drug treatment for a patient in the age group 20-29 whereas only 17% of doctors would do the same for patient in the age group 50-59. At 95 mmHg diastolic blood pressure, 76%, 54%, 30% and 18% of doctors would have started drug treatment on patient in the age group 20 to 39, 40 to 49, 50 to 59 and age group greater than or equal to 60 respectively. Thus, more than half of the patients below 49 years or age will be treated even when their diastolic blood pressures were below 100 mmHg.

- (9) *Do you treat male and female hypertensive patients in the same way?*
80% of the doctors answered they would treat male and female hypertensive patients similarly.
- (10) *Are you satisfied with the present equipment you have for measuring blood pressure?*
Altogether, 55% of the doctors and only 21% of the nurses were satisfied with their equipment for measuring blood pressure. General practitioners were mostly satisfied with their equipment (92%), whereas only 31% of government doctors were. Those dissatisfied were asked to specify their complaints. Results are given in Table III. The most common specific complaint was that the cuff of the sphygmomanometer often blow-up and most doctors and nurses complained of poor maintenance and frequent breakdown of equipment. Other complaints were : inadequate choice of cuff size, small cuff size and insufficient equipment.
- (11) *How well do you think your patients comply with antihypertensive treatment?*
Most doctors (81%) believed their patients complied with treatment most of the time. Only 2% believed patients complied all the time and 17% believed their patients did not comply at all.

DISCUSSION

The response rate of 86% of doctors and 73% of nurses can be considered adequate.

Table III – Numbers (Percentage in bracket) of Medical Staff having particular problem with their blood pressure measuring equipment.

Problem with equipment	Medical Staff		
	Doctor	Nurses	All
Equipment poorly maintained	24 (60)	30 (52)	54 (54)
Equipment often break-down	16 (40)	50 (86)	66 (74)
Suspect that reading may be inaccurate	16 (40)	23 (40)	39 (40)
Cuff often blow-up	26 (65)	53 (91)	79 (85)
Mercury column comes down too fast	16 (40)	44 (76)	60 (67)
Sounds difficult to hear	0 (0)	31 (53)	31 (40)
	40 (100)	58 (100)	98 (100)

Only 59% of doctors agreed they should measure blood pressure routinely in all out-patients. A point should be made that doctors should measure blood pressure of all patients in their individual practice, as this is the basis of opportunistic case-finding as a practicable method to detect hypertension⁽¹⁾.

Ninety percent of doctors in this survey believed that hypertensives present with headache and dizziness. By contrast, studies have shown that hypertension is essentially asymptomatic^(2,3). Only one symptom has been shown to be more common among hypertensive subjects than normotensive controls, and this is dyspnoea⁽⁴⁾. Belief in hypertensive symptoms undoubtedly underlies the practice of using symptoms as a diagnostic pointer as shown in a study⁽⁵⁾. These beliefs are also transmitted to patients, in a study⁽⁶⁾ to determine reason for drop-out of antihypertensive treatment, 78% of patients cited relief of symptom as one of the reasons.

There were no general consensus on which phase of diastolic pressure to be used, though the majority of doctors (59%) were using phase 5. The difference between phase 4 and phase 5 reading is on average about 5 mmHg⁽⁷⁾. Such a small difference is unimportant in normotensive or severe hypertensive. However, now that the benefits of treatment for mild hypertension have been confirmed in recent trials^(8,9), a difference of 5 mmHg could mean the difference between inclusion or exclusion from drug treatment. The trend is undoubtedly in favour of using phase 5. Recent important therapeutic trials^(8,10) have used phase 5 diastolic reading. There are also good reasons for doing so; the fifth phase more closely reflects the intra-arterial diastolic pressure and the between observer reproducibility is better⁽⁷⁾. Recent recommendation by British Hypertension Society⁽¹¹⁾ is in favour of using phase 5; and if the fourth phase needs to be used as when there is no recordable fifth phase, then it should be clearly recorded (for example 140/90 mmHg - Phase 4), otherwise fifth phase reading may be assumed.

Therapeutic trials have shown that treatment can prevent cerebrovascular disease^(8,10) and heart failure^(12,13). The recent MRC trial⁽⁹⁾ has however failed to show that treatment can prevent coronary artery disease in mild hypertensives. The benefit of treatment for mild hypertension (diastolic pressure 90 - 110 mmHg) as shown by these trials^(8,9) while undoubted is marginal. It is therefore reasonable to only begin drug treatment, for diastolic pressure greater than or equal to 100 mmHg, in the absence of other considerations (like other cardiovascular risk factors, target organ damage) as have been recommended^(14,15). Below 100 mmHg, the benefit of treatment is not appreciable and would increase considerably the number of hypertensives requiring drug treatment which present cir-

cumstances is unlikely to be able to cope with⁽⁵⁾. This survey however shows that doctors who may be unaware of recent trial results, tend to treat patients at lower level of pressure. For example, for a patient in the age group 40-49, 40% of doctors would commence drug treatment at diastolic pressure of 90 mmHg and 55% at diastolic 95 mmHg.

Only 20% of doctors surveyed would treat hypertensive men and women differently. Is this justified? In the MRC trial⁽⁹⁾, the benefit of treatment for women with mild hypertension was less compared to men, and indeed the overall mortality in treated women were higher than those given placebo in the trial. It would seem justifiable that one should be less enthusiastic in treating women with mild hypertension. Another consideration is that men and women differ in term of side-effects of drug therapy, in particular, men on thiazide diuretic can become impotent, at a rate of 12.6 per 1000 patient years in the MRC trial⁽⁹⁾.

There was undoubtedly widespread dissatisfaction with the instruments available for measuring blood pressure among doctors and nurses working in the public service. This is worrying considering that therapeutic decisions are frequently made on the basis of blood pressure recordings. Sphygmomanometer is an important source of potential errors in blood pressure measurements, among which the more important are defective control valve⁽¹⁶⁾ and an inflatable bladder that is too short⁽¹⁷⁾. In this study, the most common problem cited was defective cuff bladder that 'blow-up' on being inflated. The lack of any policy for maintaining sphygmomanometer is a cause for concern. Sphygmomanometer should be serviced every 6 - 12 months depending on usage⁽¹¹⁾; medical staff have the responsibility of reporting any defective equipment and should refuse to use it⁽¹¹⁾.

Most doctors (80%) believed that their patients complied with treatment. Their beliefs are justified. Study⁽¹⁰⁾ has shown that drug compliance is not a particular problem among patients who attend regularly for treatment, the critical problem is patient drop-out. Most patients who do not comply with medication eventually drop-out of treatment altogether.

In conclusion, there is a point to be made that blood pressure measurement should be made opportunistically since hypertension is often asymptomatic in contrast to what is commonly believed. Half of the doctors believe that hypertension has symptoms on presentation, particularly headache and dizziness. Many doctors are still using phase four for diastolic reading; they should use phase five. Many sphygmomanometers are in need of repair. Doctors are starting drug treatment at too low a diastolic blood pressure. Perhaps non pharmacologic treatment can be offered for the borderline hypertensive first.

ACKNOWLEDGEMENT

I wish to thank my secretary Ms S H Shim who typed this manuscript and all my staff who had given me valuable assistance in carrying out this study.

REFERENCES

1. De Souza MF, Swan AV, Shannon DJ : A long term controlled trial of screening for hypertension in general practice. *Lancet* 1976; i: 1228 -31.
2. Weiss NS : Relation of high blood pressure to headache, epistaxis and selected other symptoms. *N Engl J Med* 1972; 287: 631 - 4.
3. Waters WE : Headache and blood pressure in the community. *Br Med J* 1971; 1: 142.
4. Sleight P : Hypertension 13. 360. 382. In: Weatherall DJ, Ledingham JGG, Warrell DA .Eds. *Oxford Textbook of Medicine : Volume II*. Oxford University Press. Second Edition 1987.
5. Lim TO : The Mentakab Hypertension Study Project Part III - Blood pressure measurement and screening for hypertension in the out-patient department. *Singapore Med J* 1991; 32: 338-41.
6. Lim TO : The Mentakab Hypertension Study Project Part II - Why do hypertensive patients drop-out of treatment? *Singapore Med J* 1991; 32: 249-51.
7. Short D : The Diastolic Dilemma. *Br Med J* 1976; 2: 685 -6.
8. Management Committee. The Australian Therapeutic Trial in mild Hypertension : Report. *Lancet* 1980; i: 1261 -7.
9. Medical Research Council Working Party : MRC trial of treatment of mild hypertension : Principal results. *Br Med J* 1985; 291: 97 - 104.
10. Hypertension Detection and Follow-up Program Cooperative Group. Five years findings of the hypertension detection and follow-up program (3) Reduction in stroke incidence of persons with high blood pressure. *JAMA* 1982; 247: 633 -8.
11. British Hypertension Society. Recommendations on Blood Pressure Measurement. *Br Med J* 1986; 293: 611-5.
12. Veterans Administration Cooperative Study Group. Effects of Treatment on Morbidity in Hypertension II. Results on patients with diastolic blood pressure averaging 90 through 114 mmHg. *JAMA* 1970; 213: 1143-52.
13. Veterans Administration Cooperative Study Group. Effects of Treatment on morbidity in Hypertension I. Results in patients with Diastolic blood pressure. Averaging 115 through 129 mmHg. *JAMA* 1967; 202: 1028-34.
14. WHO/ISH mild Hypertension Liaison Committee 1989 Guidelines for the management of mild hypertension : Memorandum from a WHO/ISH meeting. *Bull WHO* 1989; 67 (5) : 493 - 8.
15. British Hypertension Society Working Party. Treating mild Hypertension. *Br Med J* 1989; 298: 694-8.
16. Conceicao S, Ward MK, Kerr DNS: Defects in Sphygmomanometers: An important source of error on blood pressure recording. *Br Med J* 1976; i: 886 - 8.
17. Simpson JA, Jamieson G, Dickhaus DW, Grover RF: Effects of size of cuff bladder on accuracy of measurement of indirect blood pressure. *Am Heart J* 1965; 70: 208 - 15.
18. Lim TO, Ngah BA, R Abdul Rahman et al: The Mentakab Hypertension Study Project Part V- Drug compliance in hypertensive patients. *Singapore Med J* 1992; 33: 63-6

ERRATUM

Transvenous Radiofrequency Catheter Ablation of Atrioventricular Accessory Pathways

C P Lau, Y T Tai

Singapore Medical Journal 1992; vol 33: 52-57

The citation of the reference of this article on page 52 is erroneously shown as "Singapore Med J 1991; Vol 32: 52-57". It should read "Singapore Med J 1992; Vol 33: 52-57".

We apologise for the typographical error