



ELSEVIER

International Journal of Cardiology 79 (2001) 129–132

International Journal of
Cardiology

www.elsevier.com/locate/ijcard

A plea for harmonising guidelines

Eoin O'Brien^{a,*}, Jan A. Staessen^b

^a*The Blood Pressure Unit, Beaumont Hospital, Dublin 9, Ireland*

^b*Studiecoördinatiecentrum, Hypertensie Eenheid, Katholieke Universiteit Leuven, Belgium*

Received 27 September 2000; received in revised form 27 December 2000; accepted 14 February 2001

The move towards holistic management of cardiovascular disease whereby patients presenting with what appears to be an isolated abnormality, such as hypertension, are evaluated for multiple risk factors is to be welcomed [1]. Indeed, acceptance of this ethos is found in three prestigious guidelines – *The Sixth Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure* (JNC VI), [2] the *1999 World Health Organisation-International Society of Hypertension Guidelines for the Management of Hypertension* (WHO/ISH), [3] and the *Guidelines for management of hypertension: report of the third working party of the British Hypertension Society* (BHS) [4].

Whereas the three guidelines are generally in accord not only on this issue, but also on the indications for treatment, the relevance of target organ involvement, the need for stringent blood pressure control in diabetic patients, and the choice of antihypertensive drugs, there is one important topic on which the guidelines differ, namely the level to which blood pressure should be reduced by antihypertensive management. The WHO/ISH guidelines [3] adopt a more aggressive approach to therapy than the JNC VI [2] and BHS [4] guidelines, which have been particularly cautious in this regard, mindful of

setting targets that are based on the evidence available, and which are also achievable in practice.

In drawing attention to discrepancy between the guidelines, we do not seek to create a controversy by setting one set of guidelines against the other, nor do we wish to detract from the undoubted overall benefit of the guidelines in striving for better blood pressure control, but rather it is our intention to identify a factual difference between the guidelines that may influence practice depending on which guideline is selected. As we extend the scope for assessment for cardiovascular disease, there is a danger that we will obscure the empirical definitions that guided management in the past. No matter how we deplore the need for definitions and cut-off points of a continuously distributed variable, the practising doctor bases management decisions on such figures. Guidelines that are intended to influence international practice should not make differing recommendations on the cut-off levels on which these decisions are made. We recognise that the evidence for making recommendations based on ambulatory, or self-measured, blood pressures is not as strong as that for conventional measurement, but though this may go some way towards explaining the discrepancy between guidelines, it does not remove the need for consistency in a recommendation as important as the goal pressure to be achieved by treatment. We will examine, therefore, the levels of blood pressure recommended for diagnosing hypertension, and the levels to which the

*Corresponding author. Tel.: +353-1-280-3865; fax: +353-1-280-3688.

E-mail address: eobrien@iol.ie (E. O'Brien).

guidelines recommend blood pressure should be lowered.

Levels of blood pressure for diagnosis

Using conventional measurement, the three guidelines agree that hypertension should be defined as a systolic blood pressure of 140 mmHg or greater and/or a diastolic blood pressure of 90 mmHg or greater in subjects who are not taking antihypertensive medication [2–4].

The guidelines differ, however, when ambulatory blood pressure measurement (ABPM) or self-measurement of blood pressure are used for diagnostic purposes. JNC VI recommends that daytime or self-measured blood pressures above 135/85 mmHg and night-time blood pressures above 120/70 mmHg should be regarded as hypertensive [2]. BHS recommends lowering the diagnostic thresholds in use for conventional blood pressures by 12/7 mmHg for ABPM daytime and self-measured blood pressures, which would give 128/83 mmHg as the upper limit of normal. In addition, the guideline defines the minimum recommended level of blood pressure control as a daytime or self-measured blood pressure greater than 140/85 mmHg, which by inference can be taken as the upper limit of normal for diagnosis. [4] WHO/ISH regards a 24-hour average or a self-measured blood pressure of 125/85 mmHg as being equivalent to a clinic blood pressure of 140/90 mmHg [2]. (The 24-h average blood pressure includes both day and night-time pressures and it is unclear how the guideline can reconcile this level with a self-measured blood pressure taken during the daytime period.) So the guidelines differ on the definition of hypertension using ABPM with recommendations for average daytime blood pressures greater than 135/85 mmHg by JNC VI [2], 140/85 mmHg by BHS [4]), and 125/85 mmHg by WHO/ISH [3]), which in summary means that using ABPM for diagnosing hypertension, the JNC VI [2] and BHS [4] recommendations for systolic blood pressure are 10–15 mmHg higher than WHO/ISH [3].

Goal blood pressures

When it comes to deciding on the goals of

treatment, there is more serious disagreement. Using conventional measurement WHO/ISH recommends that antihypertensive treatment should restore blood pressure to 'normal' (less than 130/85 mmHg) or to 'optimal' levels (less than 120/80 mmHg) in young, middle-aged or diabetic subjects, or to 'high normal' (less than 140/90 mmHg) in elderly patients [3]. JNC VI recommends that systolic blood pressure should be brought and maintained below 140 mmHg and diastolic blood pressure below 90 mmHg; it adds that lower levels may be desirable, if tolerated, especially to prevent stroke, preserve renal function and to prevent heart failure. [2] BHS recommends bringing blood pressure below 150/90 mmHg for most patients, and below 140/85 mmHg in diabetic patients, but then suggests that "optimal" blood pressures should be below 140/85 mmHg and 140/80 mmHg respectively in these groups [4]. It is evident, therefore, that using conventional measurement, there is a difference of at least 10 mmHg in the stated goal blood pressure for systolic blood pressure in non-diabetic young or middle-aged subjects between WHO/ISH [1] on the one hand and JNC VI [3] and BHS [2] on the other.

The divergence of opinion is even greater if goal blood pressure is determined using ABPM. WHO/ISH states that when ABPM measurements are used to evaluate the efficacy of treatment, daytime values should be on average 10–15 mmHg lower for systolic and 5–10 mmHg lower for diastolic pressure than the levels used for conventional measurement [3]. It follows that if ABPM was used to measure blood pressure, 'normal' daytime blood pressure would be below 120/75 mmHg, and 'optimal' blood pressure below 110/75 mmHg. The equivalent figures recommended by BHS are 140/85 and 130/80 mmHg respectively [4]. JNC VI does not give 'normal' and 'optimal' levels for daytime ABPM, but stipulates that normal daytime blood pressure should be below 135/85 mmHg [2].

So again there are significant differences between the guidelines in relation to goal blood pressures. Using conventional measurement, JNC VI [2] and BHS [4] recommend on-treatment levels that are 10–20/5–10 mmHg higher than WHO/ISH [3]; using average daytime pressure measured with ABPM, the JNC VI [2] and BHS recommendations [4] are 10–30/5–10 mmHg higher than WHO/ISH [3] depending on whether 'normal' or 'optimal' blood

pressures are chosen. The three guidelines all subscribe to a serious misconception, namely, that average daytime blood pressures using ABPM are lower than clinic readings, whereas the reality is that though clinic blood pressures may be higher than daytime pressures in hypertensive subjects, in normotensive subjects clinic blood pressure is usually much the same as daytime blood pressure and is only greater when white coat hypertension is present.

Consequences of discrepancy between guidelines

The BHS [4] and JNC VI [2] recommendations for ABPM are in accord with the generally accepted view that daytime blood pressures greater than 140/90 mm Hg are probably abnormal, whereas those below 135/85 mm Hg are probably normal, with blood pressures in the intermediate zone being considered in the overall context of individual cardiovascular risk [5–9].

Why then has WHO/ISH stepped so far out of line with JNC VI and BHS, and a large body of international opinion? Indeed the goal level of blood pressure recommended by the WHO/ISH guidelines led to an open protest on the internet, (signed by more than 800 family doctors, specialists, pharmacists, and scientists from nearly 60 countries) to the Director-General of WHO, pointing out that if these goals were accepted internationally the burden of hypertension would have serious clinical and health-economic implications, especially in the developing world. We have expressed scientific support for this concern previously in noting that using the WHO/ISH criteria for daytime blood pressures some 45% of the population of all ages, and nearly 60% of elderly people would be classified as 'hypertensive' [6,10]. The evidence is not available to support the WHO/ISH approach that the lower blood pressure the better. The Hypertension Optimal Treatment Trial did not show improved prognosis with tighter blood pressure control in all patients; only in diabetic patients there was a better outcome supporting the recommendation that tighter blood pressure control is required in patients with diabetes mellitus, renal dysfunction, or other cardiovascular risk factors [11]. A recent statistical analysis of the Framingham data challenges the WHO/ISH recommendations by showing that the concept that lower pressures imply lower risk is not

valid [12]. Meta-analyses have shown that all the observed benefit in the outcome trials in hypertension was obtained with reductions in systolic and diastolic pressures averaging 10 mmHg and 4–5 mmHg respectively [13,14].

It is not for us to say which of the guidelines will be proved correct in time. We can say, however, that the evidence presently available does not support the low goal levels of blood pressure recommended by WHO/ISH [3], and these recommendations should be viewed with caution, at least until the results of on-going longitudinal studies are available. Moreover, acceptance of these recommendations carries such serious and far-reaching clinical and financial consequences for medicine that WHO/ISH must re-examine the evidence on which their recommendations are based. Furthermore, when the three guidelines reviewed here are being revised can we make a plea for the major international bodies to get together and produce an international guideline based on the evidence available so that confusion, such as we have illustrated, does not occur in future.

References

- [1] O'Brien E, Bouchier-Hayes D, Fitzgerald D, Atkins N. The arterial organ in cardiovascular disease: ADAPT (arterial disease assessment, prevention, and treatment) clinic. *Lancet* 1998;352:1700–2.
- [2] The Joint National Committee of Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. The sixth report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure. *Arch Intern Med* 1997;157:2443–46.
- [3] Guidelines Subcommittee of the World Health Organisation – International Society of Hypertension (WHO-ISH). 1999 World Health Organisation-International Society of Hypertension Guidelines for the Management of Hypertension. *J Hypertens* 1999;17:151–83.
- [4] Ramsay LE, Williams B, Johnston GD, MacGregor GA, Poston L, Potter JF, Poulter NR, Russell G. Guidelines for management of hypertension: report of the third working party of the British Hypertension Society. *J Human Hypertens* 1999;13:569–92.
- [5] Staessen JA, Beilin L, Parati G, Waebler B, White W and the Participants of the 1999 Consensus Conference on Ambulatory Blood Pressure Monitoring. Task Force IV: Clinical use of ambulatory blood pressure Monitoring. *Blood Press Monit* 1999;4:319–31.
- [6] O'Brien E, Staessen J. What is hypertension? *Lancet* 1999;353:1541–3.
- [7] O'Brien E, Owens P, Staessen J, Imai Y, Kawasaki T, Kuwajima I. What are the normal levels of ambulatory blood pressure measurement? *Blood Pressure Monitor* 1998;3:131–2.
- [8] O'Brien F, Staessen J. Normotension and hypertension as defined 24-h ambulatory blood pressure monitoring. *Blood Pressure* 1995;4:266–82.

- [9] Pickering T. For an American Society of Hypertension Ad Hoc panel. Recommendations for the use of home (self) and ambulatory blood pressure monitoring. *Am J Hypertens* 1995;9:1–11.
- [10] O'Brien E, Staessen J. Critical appraisal of the JNC VI, WHO/ISH and BHS guidelines for essential hypertension. *Exp Opin Pharmacother* 2000;1:675–82.
- [11] Hansson L, Zanchetti A, Carruthers SG, Dahlos B, Elmfeldt D, Julius S, Menard J, Rahn KH, Wedel H, Westerling S. For the HOT Study Group: Effects of intensive blood pressure lowering and low-dose aspirin in patients with hypertension: principal results of the Hypertension Optimal Treatment (HOT) randomised trial. *Lancet* 1998;351:1755–62.
- [12] Port S, Demer L, Jennrich R, Walter D, Garfinkel A. Systolic blood pressure and mortality. *Lancet* 2000;355:175–80.
- [13] Collins R, MacMahon S. Blood pressure, antihypertensive drug treatment and the risks of stroke and of coronary heart disease. *Brit Med Bull* 1994;50:272–98.
- [14] Staessen JA, Gasowski J, Wang JG, Thijs L, Den Hond E, Boissel JP, Coope J, Ekblom T, Gueyffier F, Liu L, Kerlikowske K, Pocock S, Fagard RH. Risks of untreated and treated isolated systolic hypertension in the elderly: meta-analysis of outcome trials. *Lancet* 2000;355:865–72.