



Editorial

European and American hypertension guidelines and goal blood pressure: Relevance to India



1. Introduction

Hypertension remains as a major risk factor for premature mortality and excessive morbidity throughout the world. Chronic hypertension is a predisposing factor in the development of coronary artery disease (CAD), cerebrovascular disease (CeVD), systemic atherosclerosis, congestive heart failure (CHF), chronic kidney disease (CKD), and dementia. Together, these sequelae of hypertension exert a critical impact on public health, medical expenses and the health system(s). Despite various regional and global efforts to control hypertension, its prevalence world-wide remains high with an estimated figure of more than 1.13 billion.¹

The Global Burden of Disease (GBD) study has once again reiterated that hypertension is perhaps the most important risk factor for morbidity and mortality.² Data emanating from India are consistent with this observation and demonstrate an emerging and growing risk from hypertension in this country.³ A number of studies have shown that the chronic disease burden from hypertension is escalating in India with no end in sight.^{4–6} The unfavorable winds of cardiovascular disease (CVD) in India affect not only the urban population but also the rural settings as well.⁷ Despite some regional variations, it can be concluded that the average prevalence of hypertension [blood pressure (BP) >140/90 mmHg] in India is 25%, which translates in to more than 250 million adults! Thus, the problem of hypertension in India is tragic and overwhelming, irrespective of changing definitions.

The latest hypertension guideline from the American College of Cardiology (ACC)/American Heart Association (AHA) and other partnering societies has radically revised the thresholds to diagnose and treat hypertension⁸ (Table 1). The cut off for the diagnosis of hypertension has been lowered to >130/80 mmHg and the threshold target blood pressure goal has been changed to <130/80 mmHg. According to this new definition of hypertension, many more millions of adults suddenly require surveillance and perhaps treatment. The new American definition of hypertension has triggered some criticism and a host of viewpoints^{9–12} and the debate will surely continue for some more time.

The European Society of Cardiology (ESC) and the European Society of Hypertension (ESH) have released their new guideline for hypertension on June 9, 2018.^{13–15} This latest ESC/ESH guideline is a successor to the previous guideline issued in 2013. During this intervening period of 5 years, the task force collected and analyzed the data related to the risks imposed by hypertension and the pandemic of CVD and proposed certain preventive and therapeutic

strategies. In formulating the new guideline, the Committee conducted extensive assessment and appraisal of numerous studies, especially the controlled trials, meta-analysis, and a thorough review of the published literature. The final guideline was issued following the standard basis of class of recommendation and level of evidence.

The European guideline has not changed the classification and definition of hypertension, i.e., BP > 140/90 mmHg (Tables 2 and 3). This is in sharp contrast to American definition of hypertension, i.e., BP > 130/80 mmHg. The American and European differences in the thresholds to label hypertension are significant and of considerable public health importance. How is it possible that the new sets of guidelines released so close to each other differed on the definition of hypertension? This has baffled many, understandably so, and has led to significant confusion. The truth is that the American guideline relied heavily on the clinical studies showing incremental benefits of cardiovascular protection with decreasing BP levels whereas the European guideline relied heavily on the population attributable risk from epidemiological observations. Thus, it is the difference in the objectives of diagnosing and managing hypertension that underlie the differences in the definition of hypertension in the two guidelines. This, in essence, is the divergence between the trans-Atlantic guidelines. However, it is very important to note that both guidelines converge on common BP treatment targets of <130/80 mmHg^{13–15} (Tables 4 and 5).

The European guideline recommends that the objective of treatment should be to lower the BP to <140/90 mmHg and the “treated” value should be <130/80 mmHg or lower and a diastolic BP target should be <80 mmHg for all patients (Fig. 1). Interestingly, the European guideline recommends that in patients <65 years receiving anti-hypertensive drugs, systolic BP be lowered to 120–130 mmHg in most patients. That’s the catch! In other words, it is implicated in the European guideline that treated BP in adults should even be lower than what was proposed in the American guideline! Very interesting and intriguing indeed! Regardless of the differences in the definition of hypertension, both the guidelines agree on the point that more aggressive control of hypertension is needed than what has been recommended so far and that a treated BP level of 140/90 mmHg is no longer acceptable in most patients.

What is the relevance of the new guidelines to control hypertension in the Indian context? And what should be the take home message for the Indian practitioners? Due to the unrelenting

Table 1
Blood pressure categories in the 2017 American College of Cardiology/American Heart Association in context to the existing definitions.

Systolic, diastolic blood pressure (mm Hg)	JNC 7 ¹⁹	2017 ACC/AHA ⁸	Indian Hypertension Guideline ¹⁶
< 120 and < 80	Normal blood pressure	Normal blood pressure	Optimal
120–129 and <80	Prehypertension	Elevated blood pressure	Normal
130–139 or 80–89	Prehypertension	Stage 1 hypertension	High Normal
140–159 or 90–99	Stage 1 hypertension	Stage 2 hypertension	Stage 1 hypertension
≥160 or ≥100	Stage 2 hypertension	Stage 2 hypertension	Stage 2 hypertension

ACC- American College of Cardiology; AHA- American Heart Association; JNC- Joint National Commission.

Table 2
The latest European classification of office blood pressure and definitions of hypertension grades.

Category	Systolic blood pressure (mmHg)		Diastolic blood pressure (mmHg)
Optimal	<120	and	<80
Normal	120–129	and/or	80–84
High normal	130–139	and/or	85–89
Grade 1 hypertension	140–159	and/or	90–99
Grade 2 hypertension	160–179	and/or	100–109
Grade 3 hypertension	≥180	and/or	≥110
Isolated systolic hypertension	≥140	and	<90

Source- Williams B, Mancia G, et al. J Hypertens 2018 and Eur Heart J 2018, in press.

Table 3
European definitions of hypertension according to office, ambulatory, and home blood pressure levels.

Category	Systolic (mmHg)		Diastolic (mmHg)
Office blood pressure	≥140	and/or	≥90
Ambulatory blood pressure			
Daytime (or awake) mean	≥135	and/or	≥85
Night-time (or asleep) mean	≥120	and/or	≥70
24-h mean	≥130	and/or	≥80
Home blood pressure mean	≥135	and/or	≥85

Source- Williams B, Mancia G, et al. J Hypertens 2018 and Eur Heart J 2018, in press.

Table 4
Key messages from the 2018 European hypertension guideline.

- The first objective is to lower the blood pressure to <140/90 mm Hg in all patients.
- A companion objective is to attain a target blood pressure of <130/80 mm Hg in most patients.
- A diastolic blood pressure target of <80 mm Hg should be considered for “all” patients with hypertension.
- In patients <65 years, the achieved systolic blood pressure level should be 120–130 mm Hg.
- In patients >65 years, the systolic blood pressure target should be 130 to 140 mm Hg.
- In diabetic patients on anti-hypertensive drugs, the systolic blood pressure should be 120–130 mm Hg.
- South Asians are at the highest risk from hypertension related disease burden.

Source- Williams B, Mancia G, et al. J Hypertens 2018 and Eur Heart J 2018, in press.

Table 5
Office blood pressure treatment targets recommended by the 2018 European hypertension guideline.

	Office systolic blood pressure treatment target ranges (mmHg)					Diastolic treatment target range (mmHg)
	Hypertension	+ Diabetes	+ CKD	+ CAD	+ Stroke/TIA	
18–65 years	Target to 130 or lower if tolerated	Target to 130 or lower if tolerated	Target to <140 to 130 if tolerated	Target to 130 or lower if tolerated	Target to 130 or lower if tolerated	<80 to 70
65–79 years	Not <120	Not <120		Not <120	Not <120	
≥80 years	Target to <140 to 130 if tolerated	Target to <140 to 130 if tolerated	Target to <140 to 130 if tolerated	Target to <140 to 130 if tolerated	Target to <140 to 130 if tolerated	<80 to 70
Diastolic treatment target range (mmHg)	<80 to 70	<80 to 70	<80 to 70	<80 to 70	<80 to 70	<80 to 70

CAD- coronary artery disease; CKD- chronic kidney disease; TIA- transient ischemic attack.

Source- Williams B, Mancia G, et al. J Hypertens 2018 and Eur Heart J 2018, in press.

the BP levels to the new thresholds with available and additional resources.

References

1. NCD Risk Factor Collaboration (NCD-RiSC). Worldwide trends in blood pressure from 1975 to 2015: a pooled analysis of 1479 population-based measurement studies with 19.1 million participants. *Lancet*. 2017;389:37–55.
2. GBD 2016 Risk Factors Collaborators. Global, regional, and national comparative risk assessment of 84 behavioral, environmental and occupational, and metabolic risks or clusters of risks, 1990–2016: a systematic analysis for the global burden of disease study 2016. *Lancet*. 2017;390:1345–1422.
3. Anchara R, Kannuri NK, Pant H, et al. Hypertension in India: a systematic review and meta-analysis of prevalence, awareness, and control of hypertension. *J Hypertens*. 2014;32:1170–1177.
4. Gupta R, Pandey RM, Misra A, et al. High prevalence and low hypertension awareness, treatment and control in Asian Indian women. *J Hum Hypertens*. 2012;26:585–593.
5. Gupta R, Deedwania PC, Achari V, et al. Normotension, prehypertension and hypertension in Asian Indians: prevalence, determinants, awareness, treatment and control. *Am J Hypertens*. 2013;26:83–94.
6. Bhansali A, Dhandhanika VK, Mohan D, et al. Prevalence of and risk factors for hypertension in urban and rural India: the ICMR INDIAB study. *J Hum Hypertens*. 2015;29:204–209.
7. Singh M, Kotwal A, Mittal C, Babu SR, Bharti S, Ram CVS. Prevalence and correlates of hypertension in a semi-rural population of South India. *J Hum Hypertens*. 2018;32:66–74.
8. Whelton PK, Carey RM, Aronow WS, et al. ACC/AHA/AAPA/ABS/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA guideline for the prevention, detection, evaluation and management of high blood pressure in adults: executive summary. *J Am Coll Cardiol*. 2017;71(2018):2199–2269.
9. Wander GS, Ram CVS. Global impact of 2017 American heart association / American College of cardiology, hypertension guidelines. A perspective from India. *Circulation*. 2018;137:549–550.
10. Ram CVS. Latest guidelines for hypertension: adopt and adapt. *J Am Soc Hypertens*. 2018;12:67–68.
11. Kario K. A perspective from Japan. *Circulation*. 2018;137:543–545.
12. Mancia G, Carrao G. A perspective from Italy. *Circulation*. 2018;137:889–890.
13. Williams B, Mancia G. Barcelona, June 9, 2018 and others. *ESC/ESH Guidelines for the Management of Arterial Hypertension Presented at the 28th European Meeting on Hypertension and Cardiovascular Protection*. 2018;.
14. Williams B, Mancia G, et al. ESC/ESH guidelines for the management of arterial hypertension. *J Hypertens*. 2018; in press.
15. Williams B, Mancia G, et al. ESC/ESH guidelines for the management of arterial hypertension. *Eur Heart J*. 2018; in press.
16. Indian guidelines on hypertension (IGH)-III. 2013. *JAPI*. 2013;61(February (2)) suppl.
17. Pednekar MS, Gupta R, Gupta PC. Association of blood pressure and cardiovascular mortality in India: Mumbai cohort study. *Am J Hypertens*. 2009;22:1076–1084.
18. Geldsetzer P, Manne-Goehler J, Theilmann M, et al. Diabetes and hypertension in India: a nationally representative study of 1.3 million adults. *JAMA Intern Med*. 2018;178:363–372.
19. Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo Jr. J Jr., Jones DW, Materson BJ, Oparil S, Wright Jr. JT Jr., Roccella EJ. The seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure: the JNC 7 report. *JAMA*. 2003;289:2560–2572.

C. Venkata S. Ram*

Apollo Institute for Blood Pressure Management, World Hypertension League/South Asia Office, Apollo Hospitals, and Apollo Medical College, Hyderabad, India

Texas Blood Pressure Institute, DNA, UTSW Medical School, Dallas, USA

India Campus, Macquarie University, Medical School, Sydney, Australia

* Corresponding author.

E-mail address: drram_v@apollohospitals.com (C. Ram).

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