



Invited Commentary

American, European and international hypertension guidelines: Time to shake hands?



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ABSTRACT

Background: Following evidence-based medicine through guidelines is the first step to successfully treat hypertension and prevent cardiovascular outcomes.

Methods: This study compares the recommendations of the most recent American College of Cardiology (ACC)/American Heart Association (AHA), European Society of Cardiology (ESC)/European Society of Hypertension (ESH) blood pressure and International Society of Hypertension (ISH) focusing on prevalent contrasts among guidelines on when, how and in whom start the treatment, which is a major health implications of guidelines.

Results: The three guidelines disagree for the cut-off values in the definition of hypertension. Due to the different cut-off values of BP at the definition of hypertension, a patient may be misclassified to one of the four phenotypes of BP from office and out of office measurements, based to which guidelines are followed by the physicians. In addition to this, each society propose different risk score to evaluate the cardiovascular risk in patients with hypertension.

Conclusion: These differences cause a confusion not only to the general practitioners, but also the hypertension experts about the correct approach. The poor agreement between guidelines and diagnostic tools implies a huge number of patients remained unknown whether they should receive treatment.

The guidelines for the detection and management of hypertension in the adult population have been recently updated; the American College of Cardiology and American Heart Association (ACC/AHA) renewed their recommendations at 2017, being followed by the European Society of Cardiology and European Society of Hypertension (ESC/ESH) at 2018 and finally by the International Society of Hypertension (ISH), which provides the most recently published guidelines at 2020 [1–3].

The American and European guidelines disagree for the cut-off values in the definition of hypertension. Specifically, Americans define hypertension when blood pressure (BP) is higher than 130/80 mmHg, in all adults [1]. In contrast, hypertension is defined by the ESC/ESH guidelines as BP values higher than 140/90 mmHg, with 130/80 mmHg to be the target only for those at high cardiovascular risk [2]. ISH guidelines are in accordance with ESC/ESH, but the cut-off value of 130/80 mmHg is considered to be optimal not only for high cardiovascular risk patients but also for the whole population [3]. Different cut-off values have similarly been proposed for office and out of office BP measurements American guidelines lowered the normal values of office measurement by 10 mmHg and by 5 mmHg of ambulatory/home measurements compared to the European guidelines [1–3].

Due to the different cut-off values of BP at the definition of hypertension, a patient may be misclassified to one of the four phenotypes of BP from office and out of office measurements, based to which guidelines

are followed by the physicians. A recent study [4] revealed a huge disagreement at this field. The results showed that the agreement between the guidelines was moderate to low by using either home or ambulatory monitoring, with the poorest agreement to be identified for the classification of masked and white coat hypertension.

All guidelines agree on the importance of evaluating the cardiovascular risk in patients with hypertension. However, the difference is detected on which cardiovascular risk estimation score is proposed by each society. The ACC/AHA guidelines recommend the atherosclerotic cardiovascular disease (ASCVD) risk calculator. Many studies have evaluated ASCVD score, with the results to show an overestimation of the real risk [5–7]. On the other hand, ESC/ESH guidelines recommend the Systematic Coronary Risk Evaluation (SCORE) score for the estimation of the 10-year risk for a first fatal atherosclerotic event [8]. Finally, ISH guidelines encourage the use of different scores in the cardiovascular evaluation of patients with hypertension, especially those taken into account the BP values.

Based to this major disagreement, another important topic has been raised, regarding the BP levels at which treatment is required. As expected, Americans are advised to start antihypertensive treatment at the levels of 130/80 mmHg, while Europeans at the level of 140/90 mmHg [1,2]. Regarding the “high-normal” values of BP (130–139 mmHg for systolic BP and/or 85–89 mmHg for diastolic BP), the ESC/ESH and ISH

Abbreviations: ACC/AHA, American College of Cardiology and American Heart Association; ESC/ESH, European Society of Cardiology and European Society of Hypertension; ISH, International Society of Hypertension; BP, Blood Pressure; ASCVD, Atherosclerotic Cardiovascular Disease; SCORE, Systematic Coronary Risk Evaluation.

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Table 1
Comparison of inception of treatment among different societies.

Guideline Differences	American College of Cardiology and American Heart Association (ACC/AHA) 2017	European Society of Cardiology and European Society of Hypertension (ESC/ESH) 2018	International Society of Hypertension (ISH) 2020
BP targets for treatment	<130/80 mm Hg	140/90 mmHg, with 130/80 mmHg to be the target only for those at high cardiovascular risk	140/90 mmHg, with 130/80 mmHg is considered to be optimal for the whole population
Initial Combination Therapy	In patients > 20/10 mm Hg above BP goal	In patients ≥ 140/90 mmHg	In patients with moderate risk grade 1 hypertension
Hypertensive requiring intervention	>130/80 mm Hg	≥140/90 mm Hg	≥140/90 mm Hg
Evaluating the cardiovascular risk before the inception	ASCVD score	SCORE score	Not specific
The best choice to start	ACEi or ARB + CCB or diuretic	ACEi or ARB + CCB or diuretic	ACEi or ARB + CCB

ASCVD: AtheroSclerotic CardioVascular Disease.
SCORE: Systematic Coronary Risk Evaluation.
ACEi: Angiotensin-Converting Enzyme inhibitor.
ARB: Angiotensin Receptor Blocker.
CCB: Calcium Channel Blocker.

guidelines recommend firstly lifestyle modification, while antihypertensive treatment is considered only to those patients with very high cardiovascular risk [2,3]. The best choice to start antihypertensive treatment is renin-angiotensin-aldosterone system inhibitors combined with either diuretics or calcium channel blockers, based to Europeans and Americans [1,2]. However, ISH guidelines disagree with the choice of diuretics and recommend the combination of renin-angiotensin-aldosterone system inhibitors with calcium channel blockers as initial treatment [3]. The comparison of inception of treatment among different societies are presented at Table 1.

The most important issue is the ethical point of view. If American guidelines are correct, a huge number of hypertensive patients do not receive antihypertensive treatment when they are treated by the European guidelines; this could lead to an increased number of cardiovascular events in Europe compared to America in the next years. This will also have a negative impact on the health economy system. On the contrary, if European guidelines are right, then a huge part of the American population receives unfairly antihypertensive treatment and may face the complications of this treatment (sexual dysfunction, orthostatic hypotension, cough, edema, acute renal failure, ischemic stroke etc.). Furthermore, the misclassification of white-coat and masked hypertension and the overestimation of the real risk by ASCVD score could lead to further confusion, and more and more people to receive an unnecessary treatment.

Further to randomized control trials, more real life evidences are needed. Patients with borderline hypertension should be studied in the future in order to be clarified whether they have an increased cardiovascular risk and which way of measuring BP can better predict this possibility.

Author contributions

CA: drafting the article, final approval of the submitted manuscript.
ID: drafting the article, final approval of the submitted manuscript.
SS: critically revised the article, final approval of the submitted

manuscript.

VK: critically revised the article, final approval of the submitted manuscript.

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Declarations of competing interest

None.

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