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Hypertension in the elderly

Ipertensione nell'anziano

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Elderly hypertension;
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Summary
Introduction: There is a high prevalence of hypertension in the elderly, as evidenced by clinical and health behavioral policies. Still, there are uncertainties on the treatment of hypertension, especially treatment of the very elderly. These considerations have largely been ignored in clinical trials due to concern regarding contamination by other pathologies that are difficult to frame and manage.
Methods: We performed an effective and ample literature review and provided reflections on the Consensus Conference ACCF/AHA 2011 on the principle types of hypertension found in the elderly. We also considered the associated principle pathologies for various treatments and related organs.
Discussion: Even if the goal of treatment of elevated blood pressure in the elderly is same as in younger population, it is no longer certain that a target systolic blood pressure (SBP) $<$140 mmHg should be persistently reached in the very elderly. It is important to note that for all studies these values have never been reached. In the treatment of isolated systolic hypertension (ISH) the preferred target is a SBP $>$160 mmHg. Treating hypertension in the elderly and very elderly reduces the risk of stroke and heart failure, though the evidence is inconclusive for all-cause mortality.
Conclusion: Hypertension in the elderly is very common and needs to be treated with criteria that consider the patient's age, comorbidities, lifestyle and adherence.

Above all, in the very elderly, therapeutic treatment should be personalized according to the above criteria. Where possible pharmaceutical therapy should be limited at the preference of healthy lifestyle changes (physical activity, diet, etc.).

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Introduction

In industrialized countries, the mean age of the population is rapidly increasing. Likewise, the prevalence of high blood pressure (HBP) is also on the rise: 60% of people older than 60 years of age and 65% of men and 75% of women older than 70 have HBP [1]. These data are especially important, considering that HBP is the primary cardiovascular risk factor in elderly adults and is even stronger than hypercholesterolemia and diabetes [2]. Although there is great interest in this topic, both in the clinical and public policy settings, there are no certainties about treatment in elderly adults, and especially in the very elderly. These patients are often ignored by large clinical trials because they have multiple medical comorbidities and are difficult to manage.

Epidemiology

In the Framingham Heart Study (FHS), 90% of subjects who had normal blood pressure (BP) at age 55 subsequently developed hypertension [3]. According to ACCF/AHA Consensus Conference (2011) data, from 1995 to 2005 hypertension-related deaths increased by 25.4% in the US, due to aging of the population and an increasing prevalence of hypertension in the elderly [4]. Surprisingly, there are more Europeans with HBP than North Americans, according to a multicenter study of 6 industrialized countries across two continents [5]. Among European countries, Germany has the highest rates of HPB and Italy has more intermediate rates (Fig. 1). In Italian epidemiological studies conducted on people over 65 years of age, HBP prevalence varied from 67% (the ILSA study dating as far back as 1997) [6] to 72% (ICAR and Dicomano Study) [7] and up to 80% in older samples. These studies used a cutoff of 140 mmHg according to guidelines (CASTEL study) [8].

Pathophysiology

Somewhere around 50 and 55 years of age, systolic blood pressure (SBP) begins to increase while diastolic blood pressure (DBP) decreases (Fig. 1). With aging, large arteries develop important changes. Arterial walls stiffen because of the diminution of elastin and non-extensible collagen content along with an increase in afterload. The result is an increase in pulse wave velocity (PWV), which causes an increase in SBP and enhanced demand for myocardial oxygen. In the meantime, DBP decreases. During systole, large arteries distend with blood as their elastic walls stretch. During diastole, the walls rebound, propelling the blood. In this way, the arteries act as a pressure reservoir that maintains a constant flow of blood through the capillaries despite pressure fluctuations during the cardiac cycle. With aging, arterial stiffness increases causing an increase in SBP and DBP decreases because of the lack of arterial elasticity.

In elderly people, during the blood pressure cycle, reflected waves come back to the heart early causing a systolic peak, with an increase in SBP called the ''augmentation index''. The area under the curves, or the mean blood pressure (MBP), for younger and older people is equal, but the SBP and pulse pressure (PP) are higher while the DBP is lower in elderly subjects (Fig. 2) [9]. Increased PP is a strong coronary risk factor in elderly adults, even more so than SBP, DBP and MBP [10]. Stiffening of the arterial wall is due to altered endothelial activity, diminished flow-mediated arterial dilation, and an altered neuro-hormonal profile. The altered neuro-hormonal profile produces autonomic dysfunction [4], which results in orthostatic hypotension (with an associated risk increase for falls and syncope) and relevant cardiovascular risk factors. Kidney involvement occurs via progressive nephroangiosclerosis. It is important to stress that these changes are not physiological. The so-called ''normal aging changes'' of arteries are more commonly

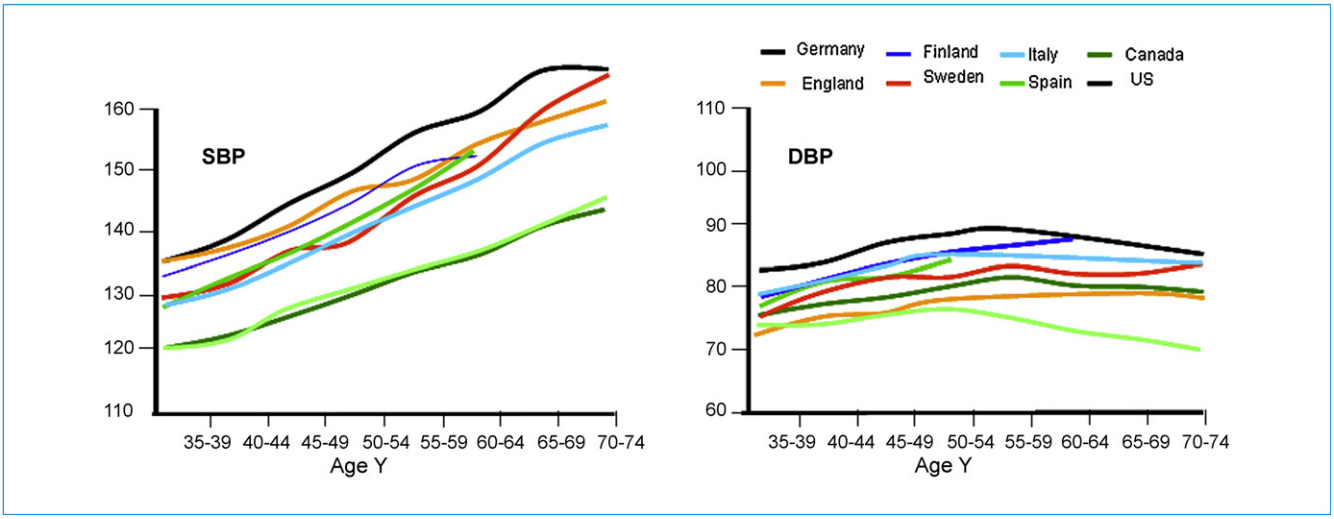

Figure 1 Mean systolic and diastolic blood pressures in 6 European and 2 north American countries, men and women combined, by age. *Modified from Wolf-Maier, K. et al.* [5].

Wolf-Maier, K. Coopper S, Banegas JR, Giampaoli S, Hense HW, Joffres M et al. Hypertension prevalence and blood pressure levels in 6 european countries, Canada, and the United States. JAMA 2003; 289:2363-2369.