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Hypertension in the elderly: which are the blood pressure threshold values?

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By the year 2050 one-fifth of the world population will surpass 80 years of age.[1]

The prevalence of arterial hypertension (AH) increases with aging. In fact, the vast majority of the elderly are affected with AH. The Framingham study demonstrated that almost two-thirds of males and three quarter of females develop AH by the age of 70 years.[2,3]

Managing blood pressure is often difficult in the elderly, not only because of comorbidities, but also due to vascular remodelling and the changes in the renal and endocrine physiology. The structural and functional arterial modifications lead to impaired vessel's compliance and increased systolic blood pressure (SBP), often with reduction of diastolic blood pressure (DBP). Hence isolated systolic hypertension, characterized by SBP $>$140 mmHg and DBP $<$90 mmHg, is more common in the elderly.[4,5] In the old patient with AH common comorbidity are coronary artery disease (CAD), heart failure, renal dysfunction, cerebrovascular disease, peripheral arterial disease, and cognitive disorders, all interfering with the natural history of AH and complicating both the therapeutic management and the prognosis.[2]

Data concerning patients over the age of 80 years and 'frail' patients are more controversial. The latter, albeit at higher risk for cardiovascular diseases (CVD), seem to benefit less from antihypertensive treatment while often incurring in the side effects of treatment. Recent studies suggest a tempering of the correlation between high blood pressure and mortality in 'frail' patients, identified by slow walking (surrogate marker of frailty).[6]

The latest guidelines of the European Society of Hypertension (ESH)/European Society of Cardiology (ESC), incorporating the evidences suggesting antihypertensive treatment in the elderly only for SBP $\geq$160 mmHg, recommended a blood pressure target for SBP $<$150 mmHg, reaching cautiously a level of $<$140 mmHg whenever possible. Nonetheless, for patients under the age of 80 years, antihypertensive treatment can be considered for SBP $>$140 mmHg, with the goal to reach values $<$140 mmHg in suitable patients tolerating the treatment well. On the other hand, elderly 'frail' patients should be treated with caution, carefully considering their comorbidities. Protracting the treatment over the 80 years of age, when well tolerated, could be considered.[7]

The ideal target for DBP in the elderly is a still unanswered question. In the SHEP study, cardiovascular risk increased in treated patients for DBP $<$70 mmHg. The Syst-Eur Trial revealed that in patients with CAD, a reduction of DBP $<$70 mmHg carried a higher risk of CVD.[8,9] The 'J' curve phenomenon has been the object of debate since its introduction by Cruickshank in 1979. Several evidences suggest an increased risk of myocardial infarction, but not of renal diseases, particularly in patients with pre-existing CAD, when the DBP is $<$85/90 mmHg. Some epidemiologic study would suggest DBP levels higher for certain groups of elderly. It is plausible that 'frail' elderly (patients with previous cerebrovascular events) would benefit from higher blood pressure to keep a satisfactory perfusion of the target organs.[10] A sensible clinical practice could be treating hypertension in the elderly by cautiously reaching a target SBP of 140 mmHg, whereas carefully avoiding a DBP $<$70 mmHg, as to maintain tissue perfusion.

Figure 1 shows the prevalence of AH treated according to various SBP targets in the outpatient population at the Sant'Andrea Hospital-University of Rome 'la Sapienza'. More than 60% of the patients over 65 years of age reached

a SBP $<$150 mmHg. The number increases to almost 70% for patients over the age of 80 years. About 40% of hypertensive patients over the age of 65 years, once treated, reach a SBP $<$140 mmHg, and more than 20% SBP $<$130 mmHg.

Considering all available data, the recommendation for a blood pressure target in the elderly should be cautious, taking into account more the individual characteristics than a general guidelines. Epidemiology data reporting significant benefit in treating elderly 'healthy' patients are solid, but we are all well aware that treating 'frail' elderly patient, with all their comorbidities and susceptibility to the side effect of drug treatment, could be challenging. The 'biologic' age appears to be more important than the 'anagraphic' age, and it should take precedence in considering antihypertensive treatment, which should be effectively 'personalized' in the elderly. Whether some patients over the age of 65 years could tolerate well intensive antihypertensive treatment, with therapeutic targets similar to the younger patients, for other patients a less ambitious target, such as $<$150/90 mmHg, could be reasonable, particularly in the 'over 80', until more specific data will become available.

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