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Medicine is a science of uncertainty and an art of probability. Blood pressure management in older people

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The prevalence of hypertension in the population increases with age and is one of the most common chronic disease in older adults [1]. Elevated blood pressure levels induce target organ damage and increase the risk of cardiovascular morbidity and mortality in late life. Studies which have been investigating the effect of hypertension on cognitive impairment have required relatively long follow-up periods.

However, it is clear untreated elevated blood pressure can cause dementia in ageing populations. Therefore, hypertension is, probably, the most relevant treatable risk factor in older adults in order to avoid dramatic consequences such permanent physical and cognitive impairment and death.

The possible benefits of blood pressure lowering for the primary and secondary prevention in very old patients has been matter of debate in the last decade. The HYpertension in the Very Elderly Trial (HYVET) [2] has been the first randomized control trial which has investigated the effectiveness of antihypertensive medication in people over the age of 80 years. The results of this study have clearly shown that the risk of total mortality, stroke, fatal stroke and heart failure was reduced in older patients (mean age 83 years) with hypertension when these were actively treated. The findings of this study have had a crucial role in adapting guidelines in older patients. However the optimum BP control to achieve the best outcome but with minimum risk is still debated. The Systolic Blood Pressure Intervention Trial (SPRINT) [3] aimed to determine whether aggressively lowering blood pressure could protect the heart, kidney, and brain over 5 years and has shown benefits of lowering blood pressure to as low as 120 mm Hg in young adults. Applying this to treat participants aged 75 years and older is now a point of major debate. The SPRINT-Senior [4] trial evaluated the effects of intensive (<120 mm Hg) compared with standard (<140 mm Hg) SBP targets in persons aged 75 years or older and suggested that an intensive treatment might be superior than treatment goals indicated by the guidelines (SBP<140 mmHg). Also, within the framework of the SPRINT MIND [5] the findings show that intensive BP control (SBP<120 mmHg) decreased the incidence of mild cognitive impairment (MCI) but did not significantly reduce the incidence of all dementia; the intensive BP control did not result in harm to cognition. It is relevant to highlight that MCI is a specific clinical condition and often a precursor of dementia; therefore, reducing the incidence of MCI in an ageing population could have a major effect in reducing the incidence of dementia later on in life.

However, individuals with diabetes mellitus, history of stroke and residents in nursing homes were not included in the SPRINT study which means that older people with chronic conditions, functional decline and frailty and possibly the highest burden of cerebrovascular pathologies were not necessarily a part of this study. It is important to note that intensive blood pressure reduction in this category of older people might increase the risk of brain hypoperfusion, kidney impairment and eventually the risk of stroke and other complications. The recent OPTIMISE trial investigated the effect of antihypertensive medication reduction vs usual care on short-term blood pressure control in patients aged 80 years and older [6]. This study showed that medication reduction is not associated with substantial change in blood pressure control in the short term (12 weeks). However, at least two issues need to be discussed: first, the long term effects of this intervention are unknown; second, investigators and participants were not blinded, therefore this might have influenced the results.

Interestingly, observational studies reported different results. A recent large study from analysis of the UK primary-care database in patients aged ≥75 (n = 415,980) reported that BP <130/80 was associated with excess mortality [7]. Conversely, hypertension did not increase mortality at ages above 85 or in younger patients with comorbidities. The Berlin Initiative Study population found that normalized blood pressure (BP), (<140/90 mmHg), was associated with a 26% increased risk of all-cause mortality in older adults [8]. These findings are in line with the results of the PARTAGE study which monitored very old, frail, institutionalized individuals. In this population, there was an inverse relationship between baseline SBP levels and all-cause mortality. The subgroup with low SBP (<130 mmHg) receiving combination antihypertensive treatment had a greater than 2-fold risk for mortality during and after the 2 years of follow up [9]. The latter findings point to the possible risk of harm with overtreatment in elderly individuals, especially when frail.

One of the consequences of all the previous findings is the limited agreement in guidelines for treating older patients with hypertension. Actually, what do guidelines say? The European ESH/ESC [1] guidelines set
the target blood pressure in older adults as $<140/90$ mmHg, similar to the Canadian Hypertension Guidelines [10]. If the treatment is well tolerated than the goal can be $<130/80$ mmHg, but not below SBP $<130$ mmHg which might increase the risk of harm. The same cut-off of $<130/80$ mmHg with particular care for co morbidities is the goal suggested by the American Guidelines [11]. An interesting point is raised by the NICE Guidelines [12]: this document suggests to reduce BP levels $<140/90$ mmHg in older adults under 80 years and to limit the goal at 150/90 mmHg in patients aged 80 years and older. Moreover, the target levels of BP should be based on standing BP measured levels in patients with signs and symptoms of postural hypotension. This is a novel interesting concept in the extremely dynamic phenomenon of blood pressure regulation.

However, geriatricians should not be not interested in comparing guidelines. Are we? Treatment decisions should be based on the biological age and patient’s phenotype and not according to the chronological age and an arbitrary definition of ‘old age’.

We access patients comprehensively and not selected on age only, let’s say 70-year-old, 80-year-old, 90-year-old. It is well known that within these age categories a high degree of heterogeneity due to comorbidity, polypharmacy cognitive status and, eventually, vitality is observed. The importance of role of postural changes in blood pressure should be emphasized. Therefore measurement of standing blood pressure should be routinely done in older patients.

Moreover, considering the age-related cardiovascular structural and functional changes, such as arterial stiffness and the consequent high prevalence of isolated systolic hypertension, the impaired baroreflex function and secondary short- and long term blood pressure dysregulation [13], together with cardiac dysfunction and the often underestimated impaired renal function the choice to treat or not to treat should be taken carefully. The importance of the harm caused by possible side effects of medications should be strictly monitored.

Finally, in the frail older patients we should take into account two more important issues: the life expectancy in order extrapolate the possible time to benefit and the wish of the patient for an optimal shared decision making.

Treating blood pressure levels in older people is not merely a question of lowering mean pressure levels. We deal with a relatively novel and extremely heterogeneous category of patients, with frequent hemodynamic postural disorders, challenging comorbidities, often incident side effects of medications and, eventually different degrees of vitality at same categories of age. Therefore, we should trust guidelines suggesting different therapeutic approaches. The NICE and the ESH/ESC guidelines have moved the first steps in this direction.

In summary, geriatricians should comprehensively consider the patient, perform adequate blood pressure measurements, if needed in the standing position, and achieve BP levels of 140/90 mmHg only when well tolerated. For the population over 80 years a target on 150/90 mm Hg (standing position) may be more appropriate.
References


