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Management of Hypertension in Elderly

ARTICLE INFORMATION

ABSTRACT

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Background: The document on hypertension in the elderly promoted by the American college of cardiology and the American heart association (ACCF/AHA) was written with the intent to be a complete reference at the time of publication on the topic of managing hypertension in the elderly. More recently, the European society of hypertension (ESH) and the European society of cardiology (ESC) issued the 2013 ESH/ESC Guidelines for the management of arterial hypertension, followed by The 2014 Canadian Hypertension Education Program (CHPE), and the Eighth Report of the Joint National Committee (JNC8), all of which has endorsed specific recommendations for the management of elderly hypertensive patients.

Objectives: Outline and summarize the most critical aspects in the management of arterial hypertension in the elderly.

Contemporary Management of Hypertension in Elderly: Pharmacological treatment for elderly hypertensive patients has been cautiously recommended due to alterations in drug distribution and disposal and changes in homeostatic CV control. The initial antihypertensive drug should be started at the lowest dose and gradually increased, depending on BP response, to the maximum tolerated dose, with the aim to achieve the specified treatment targets. However, there still remain many important issues regarding hypertension treatment in the elderly to be solved.

Introduction:

Several years ago, the inevitable rise in systolic blood pressure (SBP) with ageing promoted the notion that this was an essential adaptive response to support organ perfusion, and an empiric formula (the 100 + age in years) was often used to estimate what has been considered as the "Appropriate SBP". However, with the launch of the Fifth Report of the Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure (JNC5)⁽¹⁾, the trends in the management of hypertension (HT) have shifted from a primary emphasis on controlling diastolic blood pressure (DBP) to progressively greater emphasis on controlling SBP.

Data from the Framingham Heart Study⁽²⁾ and other epidemiologic investigations afford persuasive evidence designating SBP as a detrimental independent risk factor for incident cardiovascular (CV) events in all decades of life⁽³⁾. Subsequently, the JNC7 addressed specific consideration for the management of older hypertensive patients⁽⁴⁾. Recently, an Expert Consensus Document on Hypertension in the Elderly promoted by the American College of Cardiology Foundation and the American Heart Association (ACCF/AHA) was written with the intent to be a complete reference at the time of publication on the topic of managing hypertension in the elderly⁽⁵⁾. More recently, The Task Force for the management of arterial hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC) issued the 2013 ESH/ESC Guidelines for the management of arterial hypertension, followed by The 2014 Canadian Hypertension Education Program (CHPE), and the

JNC8 Report, all of which has endorsed specific recommendations for the management of elderly hypertensive patients⁽⁶⁻⁸⁾. Embracing the above mentioned modernized recommendations⁽⁵⁻⁸⁾, the article presented herein, aims to outline and summarize the most critical aspects in the management of arterial hypertension in the elderly.

Pathophysiology of Hypertension Related to Aging:

It is not possible to define elderly on a purely physiological basis, because rates of vascular aging among individuals vary considerably. The ACCF/AHA committee agreed to use the traditional demographic definition of ≥ 65 years of age to define the elderly population, however, further age-specific subgroups like the "very elderly" (≥ 85 years) were also recognized. Similarly, the ESH/ESC guidelines and the CHPE lack a precise definition of elderly patients⁽⁵⁻⁷⁾. While recommendations of the JNC8 has been generally addressed to hypertensives ≥ 60 years of age⁽⁸⁾.

Aging is associated with a progressive increase in aortic stiffness, partly due to fatigue fracture of elastin, collagen deposition, and calcification⁽⁹⁾. These changes will consequently increase pulse wave velocity, and causing late SBP augmentation, with an increase in myocardial oxygen demand. Reduction of forward flow is another possible adverse alteration, enhanced by the presence of coronary stenosis or during reductions in DBP, which will further limit organ perfusion⁽¹⁰⁾.

Accordingly, SBP raises gradually across the adult age span, in contrast, DBP peaks and plateaus in late middle-age, then start to decline slightly thereafter. As a result, the

proportion of hypertensive patients with isolated systolic hypertension (ISH) increases with age. Actually, diastolic hypertension accounts only for 10%, while ISH accounts for over 90% of all hypertension patients after the age of 70 years^(2,11).

Diastolic BP of <70 mm Hg in older individuals is associated with similar increased coronary artery disease (CAD) risk as that associated with DBP \geq 90 mm Hg⁽¹²⁾. This bimodal relationship between DBP and CV risk compels the emergence of pulse pressure (the difference between SBP and DBP), as a stronger risk factor than SBP, DBP, or mean pressure in older adults. Again, with respect to age, in patient <50 years of age, DBP was the strongest predictor, while at age 50-59 years all three BP indexes were comparable predictors, and from 60-79 years of age, DBP was negatively related to CAD risk so that pulse pressure became superior to SBP^(13,14).

The progressive glomerulosclerosis and interstitial fibrosis developed in the aging kidney, associated with a reduction in glomerular filtration rate (GFR) and other renal homeostatic mechanisms, promotes hypertension through increased intracellular sodium, reduced sodium-calcium exchange, and volume expansion⁽¹⁵⁾. In addition to the suppression of plasma renin activity and low aldosterone levels, the decrease in kidney mass that occurs with aging will provide fewer transport pathways for potassium excretion and makes elderly patients with hypertension more prone to drug-induced hyperkalemia^(16,17).

Reduction in baroreflex function and increase in venous insufficiency is another age-associated aspect contributing to the high prevalence of orthostatic BP dysregulation in the elderly. When elderly hypertensive patients were classified in relation to their orthostatic SBP, silent cerebral infarcts were more common in orthostatic hypertension (OHT) and orthostatic hypotension (OHYP) than in the orthostatic normotension (ONT) group, while only OHT group showed a greater frequency of electrocardiographically verified left ventricular hypertrophy (LVH) than the ONT group⁽¹⁸⁾.

The possibility of a secondary cause of hypertension should always be considered: primary aldosteronism and renal artery stenosis may be quite common in the elderly than was believed years ago. Likewise, obstructive sleep apnea, thyroid disorders, lifestyle, and medications can also be important contributors^(5,6).

Contemporary Management of Hypertension in Elderly:

Although, the traditional definition upon which the clinical diagnosis of hypertension (established by demonstrating a SBP \geq 140 mm Hg and/or a DBP \geq 90 mm Hg), might not be appropriate, these criteria are stagnant and have not been further characterized for the elderly population⁽⁵⁻⁸⁾.

The ACCF/AHA and ESH/ESC have recommended the identification of pseudohypertension, a falsely measured high SBP that result from increased arterial stiffness due to heavily calcified uncompressible arteries. It should be suspected in elders with refractory hypertension and no organ damage, which is necessary to avoid overtreatment and should be recognized as one of the common causes of age associated spurious resistant hypertension^(5,6).

The case for using out-of-office BP readings in the elderly, particularly ambulatory BP monitoring (ABPM) is recommended by both ACCF/AHA and ESH/ESC to confirm the diagnosis of white-coat hypertension in patients with

persistent office hypertension but no organ damage^(5,6). Moreover, whenever office BP readings are not adequately conclusive, ABPM should be performed regularly, not only to exclude spurious resistance but also to quantify to a better degree the BP elevation and the subsequent effect of the treatment modifications⁽⁶⁾. It is also indicated when syncope or hypotensive disorders are suspected, and for evaluation of vertigo and dizziness. Finally, using home BP measurements is strongly recommended due to potential hazards of excessive BP reduction in older people and better prognostic accuracy versus office BP⁽⁵⁾.

Recommendations for Evaluation:

Typical evaluation for elderly patients with known or suspected hypertension should include history, physical examination and bidding diagnostic and prognostic laboratory or other tests. Nonetheless, considering the time limits of a typical outpatient encounter, the ACCF/AHA have stressed the importance to emphasis on aspects of the history and examination that relate to hypertension, which might comprises: identifying reversible and/or treatable causes, evaluation for organ damage, assessment for other CV risk factors, identifying comorbid conditions affecting prognosis, and identifying barriers to treatment adherence⁽⁵⁾.

However, with limited evidence to support routine laboratory testing, a purposeful approach is recommended by the ACCF/AHA and ESH/ESC, that may cover: urinalysis for evidence of renal damage, especially albuminuria and microalbuminuria, serum creatinine with eGFR and potassium, lipid profile (including total cholesterol, low-density lipoprotein cholesterol, high density lipoprotein cholesterol, and triglycerides), fasting blood glucose (including hemoglobin A1c if there are concerns about diabetes mellitus), and an electrocardiogram with two dimensional echocardiography in selected elderly persons to evaluate for LVH and LV dysfunction that would warrant additional therapy^(5,6).

Recommendations for Treatment:

Pharmacological treatment for elderly hypertensive patients has been cautiously recommended due to alterations in drug distribution and disposal and changes in homeostatic CV control. The initial antihypertensive drug should be started at the lowest dose and gradually increased, depending on BP response, to the maximum tolerated dose⁽⁵⁻⁷⁾.

The general BP goal recommended by the ACCF/AHA in uncomplicated hypertension is <140/90 mm Hg, and although it is unclear whether target SBP should be the same in patients <80 or >80 years of age, the committee recommended that SBP <130 and DBP <65 mm Hg should be avoided in octogenarians to avert impairment of vital organ perfusion. Furthermore, standing BP should always be checked for excessive orthostatic decline⁽⁵⁾.

In elderly hypertensives with SBP \geq 160 mmHg the ESH/ESC recommended reducing SBP to 140-150 mmHg, provided they are in good physical and mental conditions, though, in patients <80 years age, antihypertensive treatment may be considered at SBP values >140 mmHg and aimed at values <140 mmHg, if the individuals are fit and treatment is well tolerated⁽⁶⁾. Similarly, in 2013, the CHEP introduced SBP <150 mmHg as a treatment target for adults \geq 80 years of age, followed by the addition of SBP \geq 160 mmHg as the pharmacotherapy initiation threshold in the next year^(7,19).

The JNC8 has strongly recommended the initiation of pharmacologic treatment in hypertensive persons aged ≥ 60 years at BP $\geq 150/90$ mmHg to a goal of $<150/90$ mmHg⁽⁸⁾.

Treatment in uncomplicated hypertension should be initiated with single drug, preferably a low-dose thiazides, calcium antagonist, or renin-angiotensin-aldosterone system blockers. When the BP is $>20/10$ mm Hg above goal, therapy should generally be initiated with two antihypertensive drugs, one of which should be a thiazide diuretic. If the antihypertensive response is inadequate after reaching the full dose of two classes of drugs, a third drug from another class should be added⁽⁵⁻⁷⁾. Nevertheless, caution concerning the substantial decrease in DBP (≤ 60 mm Hg) in respond to initial combination therapy was upraised again and should be extremely exercised for elderly patients in whom it is more likely to occur. However, in the elderly, treatment must be individualized and when additional comorbidities complicate hypertension, at least 2 drugs should generally be used⁽⁵⁻⁷⁾.

Before adding new antihypertensive drugs, possible reasons for inadequate BP response should be examined, take account of non-adherence, volume overload, possible drug interactions, as well as associated conditions for instance obesity, smoking, excessive alcohol intake, insulin resistance, and pseudoresistance. Causes of secondary hypertension should be identified and treated if possible⁽⁵⁾.

The JNC8 recommended that if goal BP is not reached within a month of treatment, the dose of the initial drug (thiazide-type diuretic, CCB, ACEI, or ARB) should be increased or a second drug from other classes is added. The clinician should continue to assess BP and adjust the treatment regimen until goal BP is reached, if goal BP cannot be reached with two drugs, add and titrate a third drug. Do not use an ACEI and an ARB together in the same patient⁽⁸⁾.

Addressing Unresolved Issues:

Apart from epidemiologic evidence that hypertension remains a risk factor in 80-89 year olds, the above guidelines avoided firm recommendations on drug treatment in octogenarians with statements like "in subjects aged 80 years or over, evidence for benefits of antihypertensive treatment is as yet inconclusive." However, they added that "there is no reason for interrupting successful and well-tolerated therapy when a patient reaches 80 years"⁽⁵⁾.

The ACCF/AHA has argued that there still remain many important issues regarding hypertension treatment in the elderly. One is to agree on a working definition of the term elderly. Another is to establish BP values for making the diagnosis of hypertension as well as setting targets for treatment. A third is to identify, for those patients in whom pharmacological therapy is indicated, which drugs will be most effective for reducing CV events. A final question is whether there is a subgroup of elderly patients with hypertension in whom treatment is not beneficial⁽⁵⁾.

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