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Hypertension Q&A

Diastolic Blood Pressure: How Low Can You Go?

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Q: What is the lowest acceptable diastolic blood pressure (DBP) in a patient with systolic hypertension who is older than 65 years?

A: Until the 1990s, hypertension was largely defined using only the criterion of elevated DBP. However, with the aging and increased longevity of the population, the incidence of predominantly systolic hypertension is on the rise. Isolated systolic hypertension (ISH) is now the most common subtype of hypertension in American adults. The third National Health and Nutrition Examination Survey (NHANES III, 1988-1991) reported that 75% of persons with hypertension were 50 years or older and that about 80% of those untreated or inadequately treated had ISH.¹

Despite the observed benefits of aggressive therapy, physicians have remained reluctant to treat patients to recommended BP goals. A major concern has been related to the perception of a "J curve," particularly for DBP. The J curve refers to a reduction in cardiovascular risk as DBP declines to a given level, usually between 65 and 75 mm Hg, at which point cardiovascular risk rises in the presence of an increase in systolic blood pressure (SBP). Only a few anecdotal reports of increased cardiovascular events with excessive reduction of DBP support a J-curve effect. Moreover, no observed SBP relationship suggests increased cardiovascular risk in association with DBP reduction in the absence of evidence of cerebral hypoperfusion.

The best evidence against a J-curve effect for DBP comes from the Hypertension Optimal Treatment (HOT) trial, in which hypertensive patients randomized to a target DBP of 80 mm Hg demonstrated no increase in cardiovascular events compared with those randomized to a higher DBP.²

Patients at higher risk. Concerns have persisted regarding a possible J-curve effect for patients with occlusive coronary artery disease. In contrast to other organs, the heart is perfused mostly during diastole and thus could be more vulnerable to low DBP, with resulting cardiac ischemia and a paradoxical increase in cardiovascular risk. A secondary analysis of data from the International Verapamil-Trandolapril Study (INVEST) has addressed this concern.³ Patients in this study, who had clinically stable coronary artery disease and hypertension, were randomly assigned to a verapamil- or atenolol-based treatment strategy. The relationship between BP and the primary outcome--all-cause death and total myocardial infarction (MI)--was in fact J-shaped, particularly for DPB, with a nadir at 119/84 mm Hg. At lower DBPs there were substantially more MIs than strokes. Low DBPs were associated with a relatively lower risk for all-cause death and total MI in patients who underwent coronary revascularization than in those who did not undergo revascularization. The authors concluded that the risk of all-cause death and MI, but not stroke, increased progressively with low DBP.

Obviously, older patients need to be evaluated individually; gradual uptitration of antihypertensive therapy should be accompanied by careful attention to any symptoms that suggest low BP. The J-curve effect should not, however, deter practitioners from aggressively treating SBP in older patients.

Another marker of risk. Systolic, rather than diastolic, hypertension is associated with a greater risk of cardiovascular morbidity in middle-aged and elderly persons.⁴ ISH and increased pulse pressure have been identified as independent cardiovascular disease risk factors among elderly hypertensive patients. In the presence of concordant elevations of SBP and DBP, as seen in systolic-diastolic hypertension, SBP does not predict risk better than pulse pressure. However, in patients with discordantly low DBP along with elevated SBP--as seen in ISH--pulse pressure becomes a dominant predictor.

Intrinsic structural changes in elderly persons with ISH lead to increased stiffness of the thoracic aorta and its branches while more peripheral muscular arteries are spared. In younger patients with essential hypertension, the major structural changes occur in the small muscular arteries with increased vascular resistance. When the divergent patterns of onset and differences in hemodynamics seen in systolic-diastolic hypertension (commonly referred to as essential hypertension) and ISH are reviewed, two distinct disorders with significant overlap are suggested. This concept is further supported by the Framingham Heart Study data, which suggest that most patients in whom ISH develops do not pass through a state of diastolic hypertension but progress directly from high normal BP.

Management. Treatment recommendations for systolic hypertension in older persons follow the principles for the management of hypertension outlined in the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC 7).⁵ It is prudent to start with lower initial drug dosages to minimize the risk of hypotensive symptoms; however, usual doses and multiple agents are required in most older patients to reach appropriate BP goals. Avoid excessive reduction of DBP in hypertensive patients with coronary artery disease.

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