EXPEDITED REVIEW

Effects of Normal, Pre-Hypertensive, and Hypertensive Blood Pressure Levels on Progression of Coronary Atherosclerosis

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OBJECTIVES: The purpose of this study was to evaluate the effects of normal blood pressure (BP), pre-hypertension, and hypertension on progression of coronary atherosclerosis.

BACKGROUND: The Seventh Report of the Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC-7) classifies BP as normal, pre-hypertension, and hypertension. The effects of these categories on progression of coronary atherosclerosis are unknown.

METHODS: The 274 patients who completed the intravascular ultrasound (IVUS) substudy of the CAMELOT (Comparison of Amlodipine Versus Enalapril to Limit Occurrences of Thrombosis) trial were included. The entry criteria were ≥1 angiographic coronary stenosis >20% and diastolic BP <100 mm Hg. Patients underwent a baseline coronary IVUS, which was repeated after 2 years of amlodipine, enalapril, or placebo therapy. The BP was evaluated periodically, and the averages of the measurements were used in the analyses.

RESULTS: Mean BP throughout the study was 127.0 ± 12.0/75.5 ± 6.8 mm Hg. In multivariable analysis, significant determinants of progression included systolic BP (r = 0.16; p = 0.006) and pulse pressure (r = 0.14; p = 0.02). Patients with "hypertensive" average BP had a 12.0 ± 3.6 mm³ (least-square mean ± SE) increase in atheroma volume, those with "pre-hypertensive" BP had no major change (0.9 ± 1.8 mm³), and those with "normal" BP had a decrease of 4.6 ± 2.6 mm³ (p < 0.001 by analysis of covariance; p < 0.05 for comparison of all pairs).

CONCLUSIONS: The most favorable rate of progression of coronary atherosclerosis is observed in patients whose BP falls within the "normal" JNC-7 category (i.e., systolic BP <120 mm Hg and
diastolic BP <80 mm Hg). This study suggests that in patients with coronary artery disease, the optimal BP goal may be substantially lower than the <140/90 mm Hg level.

Abbreviations and Acronyms

BP = blood pressure
CAMELOT = Comparison of Amlodipine Versus Enalapril to Limit Occurrences of Thrombosis trial
DBP = diastolic blood pressure
HDL = high-density lipoprotein
IVUS = intravascular ultrasound
JNC-7 = Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure
LDL = low-density lipoprotein
LOWESS = locally weighted scatterplot smoothing
SBP = systolic blood pressure