Effects of Angiotensin-Converting Enzyme Inhibitors on Central Blood Pressure

To the Editor:

From a substudy of the Australian National Blood Pressure 2 (ANBP2) trial, Dart et al concluded that there was no evidence for a disproportionate lowering of central systolic pressure to explain the favorable effects of an angiotensin-converting enzyme inhibitor over diuretic in the main ANBP2 study. Results of the substudy, however, conflict with another, which used a Food and Drug Administration–validated method to show a greater (3.2 mm Hg) reduction of aortic systolic pressure with enalapril as compared with diuretic for the same reduction of brachial systolic pressure and with no change in heart rate.

There may be a systematic error in the method used by Dart et al for calibration of the central systolic pressure. Their method assumes the identity of mean blood pressure (MP) and of diastolic blood pressure (DP) in central and peripheral arteries. This calculates central systolic pressure by extrapolation from (MP−DP) as measured in the upper limb. Authors used a Dinamap 1846XT brachial cuff device, which was developed from a previous Dinamap 845 cuff device. Accuracy of the 1846XT device has been questioned as failing to conform with British Hypertension Society standards. Assessment of the 845 device showed that it overestimated diastolic pressure and underestimated mean pressure, such that the value of (MP−DP) given by the cuff was 5.2 mm Hg on average less than measured by simultaneous aortic cannulation. With the extrapolation method used for calculating aortic systolic pressure, this could account for an error in estimation of central aortic systolic pressure of 10 mm Hg or more.

Authors are urged to consider this technological issue. It may explain the apparent identity of systolic and pulse pressure in their substudy, as was seen in the earlier assessment using the Dinamap 845 device (instead of the amplification usually seen). It may also explain the authors' paradoxical findings in another substudy of ANBP2, which showed apparent superiority of brachial over central systolic pressure in predicting cardiovascular events.

Disclosures

M.F.O. is a founding director of AtCor Medical, manufacturer of pulse wave analysis systems. W.M. is a consultant to AtCor Medical. M.E.S. has nothing to disclose.

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