Differential Effects Between a Calcium Channel Blocker and a Diuretic When Used in Combination With Angiotensin II Receptor Blocker on Central Aortic Pressure in Hypertensive Patients

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The aim of this study was to compare the effects between calcium channel blockers and diuretics when used in combination with angiotensin II receptor blocker on aortic systolic blood pressure (BP) and brachial ambulatory systolic BP. We conducted a prospective, randomized, open-label, blinded end point study in 207 hypertensive patients (mean age: 68.4 years). Patients received olmesartan monotherapy for 12 weeks, followed by additional use of azelnidipine (n=103) or hydrochlorothiazide (n=104) for 24 weeks after randomization. The central BP, aortic pulse wave velocity (PWV), and ambulatory BP were assessed at baseline and 24 weeks later. After adjustment for baseline covariates, the extent of the reduction in central systolic BP in the olmesartan/azelnidipine group was significantly greater than that in the olmesartan/hydrochlorothiazide group (the between-group difference was 5.2 mmHg; 95% CI: 0.3 to 10.2 mmHg; *P*=0.039), whereas the difference in the reduction in brachial systolic BP between the groups was not significant (2.6 mmHg; 95% CI: -2.2 to 7.5 mmHg; *P*=0.29). The aortic PWV showed a significantly greater reduction for the olmesartan/azelnidipine

combination than for the olmesartan/hydrochlorothiazide combination (0.8 m/s; 95% CI: 0.5 to 1.1 m/s; *P*<0.001) after adjustment for covariates. The extent of the reduction in brachial ambulatory systolic BP was similar between the groups. These data showed that the combination of olmesartan (20 mg) and azelnidipine (16 mg) had a more beneficial effect on central systolic BP and arterial stiffness than the combination of olmesartan (20 mg) and hydrochlorothiazide (12.5 mg), despite the lack of a significant difference in brachial systolic BP reduction between the 2 treatments.