Abstract: P308

Coronary vascular function in patients with resistant hypertension and normal myocardial perfusion imaging: a propensity score analysis

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Background. Impaired myocardial perfusion reserve (MPR) is an indicator of hypertensive vascular damage. Patients with resistant hypertension (RH) are at higher risk of hypertension-mediated organ damage and premature cardiovascular events, in these patients a reduction of MPR may occur earlier than coronary atherosclerosis and it may be an early manifestation of developing coronary artery disease (CAD).

Purpose. We evaluated the relationship between resistant hypertension and MPR assessed by rubidium-82 (82Rb) Positron Emission Tomography (PET)/Computed tomography (CT) in patients with systemic arterial hypertension after balancing for coronary risk factors.

Methods. We studied 360 subjects without overt coronary artery disease and normal myocardial perfusion imaging assessed by stress-rest 82Rb PET/CT. To account for differences in baseline characteristics between patients with resistant and controlled hypertension, we created a propensity score-matched cohort considering clinical variables and coronary risk factors.

Results. Before matching, patients with RH were significantly older, had higher prevalence of male gender and hypercholesterolemia, and showed significantly lower global hyperemic myocardial blood flow (MBF) and MPR as compared to those with controlled hypertension, while baseline MBF values and coronary artery calcium (CAC) content were similar in both groups. After matching, there were no statistical significant differences between patients with resistant and controlled hypertension, but patients with RH still had lower hyperemic myocardial blood flow and MPR (both P <0.001).

At univariate and multivariate linear regression analyses, age, resistant hypertension and coronary artery calcium resulted significant predictors of lower MPR values (all P <0.05), in the overall study population and in the propensity score-matched cohort. At correlation analysis only in patients with controlled hypertension age was inversely related to MPR (P <0.05). There was a decrease in MPR with increasing CAC scores in both controlled and resistant hypertensive patients. RH was associated with lower MPR across CAC categories (P <0.001).

Conclusions. Patients with RH had a significantly blunted hyperemic MBF and MPR compared to patients with controlled hypertension, even after balancing clinical characteristics by propensity score analysis. The identification of impaired MPR could help to identify early structural alterations of the arterial walls in patients with RH.