Low dose-eplerenone treatment decreases aortic stiffness in patients with metabolic syndrome

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Backgrounds: Metabolic syndrome is a well-established cardiovascular risk factor with increasing prevalence and incidence globally. Our aim in this study was to analyse the effect of a low dose steroidal mineralocorticoid receptor antagonist on metabolic parameters, aortic stiffness parameters and endothelial function (as assessed by measuring baseline nitric oxide activity) of the macrovasculature in patients with metabolic syndrome.

Methods: Patients with mild uncomplicated primary arterial hypertension and at least 2 of the following traits of the metabolic syndrome (Adult Treatment Panel III criteria: abdominal obesity (abdominal girth ≥ 102 cm in males), triglyceride level ≥ 150 mg/dL or treatment for elevated triglycerides, HDL < 40 mg/dL or treatment for low HDL, fasting blood glucose ≥ 100 mg/dL and ≤ 126 mg/dl) were included in the study. After the wash-out of antihypertensive medication (if applicable), patients were treated with eplerenone (EPL) 25 mg for the next 10 weeks. Pulse wave analysis was performed before and after infusion of L-NMMA (=nitric oxide-synthase inhibitor) at baseline and after treatment with EPL.

Results: In patients with metabolic syndrome (n=23), HbA1c (5.8 ± 0.3 vs. 6.0 ± 0.3 %; p=0.012) and HDL (41.5 ± 8.1 vs. 44.1 ± 10 mg/dl; p=0.046) increased significantly with EPL treatment. Central systolic pressure (132 ± 11.6 vs. 124.8 ± 12.9 mmHg; p=0.015), augmentation pressure (15.2 ± 26.9 vs. 11.9 ± 23.1 mmHg; p=0.011), augmentation index (22.5 ± 7.8 vs. 18 ± 11.1 %; p=0.028, independent of systolic office blood pressure (BP) reduction), and augmentation index normalized to heart rate of 75/min (18.6 ± 7.8 vs. 14.5 ± 8.8 %; p=0.006, independent of systolic office BP reduction) reduced significantly with EPL treatment. Augmentation index normalized to heart rate of 75/min increased significantly with infusion of L-NMMA after treatment with EPL (14.7 ± 8.8 vs. 17.6 ± 8.3; p=0.004), whereas no such difference could be noticed at baseline (p=0.230) thereby indicating an increased nitric oxide availability.

Conclusions: Our data show that EPL beneficially affects markers of arterial stiffness in patients with metabolic syndrome, independent of central BP reduction. Whether the observed benefits could be noticed with nonsteroidal mineralocorticoid receptor antagonists without change in metabolic parameters warrants further investigation.