The aldosterone renin ratio predicts cardiometabolic disorders in subjects without classic primary aldosteronism

Vecchiola, A., Fuentes, C. A., Barros, E. R., Martínez-Aguayo, A., García, H., Allende, F., ... & Campino, C. (2019). The aldosterone/renin ratio predicts cardiometabolic disorders in subjects without classic primary aldosteronism. American journal of hypertension, 32(5), 468-475. <10.1093/ajh/hpz023> Accessed 24 Jul 2020.

Abstract

BACKGROUND

Aldosterone has been linked with obesity, metabolic syndrome (MetS), pro-inflammatory, and prothrombotic states; however, most studies relate these indicators with primary aldosteronism (PA), excluding non-PA patients.

OBJECTIVE

To determine whether aldosterone, renin, or the plasma aldosterone/renin ratio (ARR) are associated with metabolic disorders and inflammatory/vascular biomarkers in a non-PA population.

METHODS

We studied 275 patients including adolescents and adults of both genders and measured plasma and urinary aldosterone and determined the plasma renin activity. In all subjects, the presence of MetS was determined according to Adult Treatment Panel III. Renal, vascular, inflammatory, and mineralocorticoid activity biomarkers were evaluated.

RESULTS

The ARR correlated with the number of variables of MetS (r = 0.191, P = 0.002), body mass index (BMI; r = 0.136, P = 0.026), systolic blood pressure (r = 0.183, P = 0.002), diastolic blood pressure (r = 0.1917, P = 0.0014), potassium excreted fraction (r = 0.174, P = 0.004), low-density lipoprotein (r = 0.156, P = 0.01), plasminogen activator inhibitor type 1 (r = 0.158, P = 0.009), microalbuminuria (r = 0.136, P = 0.029), and leptin (r = 0.142, P = 0.019). In a linear regression model adjusted by age, BMI, and gender, only the ARR was still significant (r = 0.108, P = 0.05). In a logistic regression analysis, the ARR predicted MetS index (odds ratio (OR) = 1.07 [95% confidence interval (CI) = 1.011– 1.131], P= 0.02) even after adjusting for age, BMI, and gender. On the other hand, aldosterone showed no association with MetS or inflammatory markers.

CONCLUSION

These results suggest a continuum of cardiometabolic risk beyond the classic PA threshold screening. The ARR could be a more sensitive marker of obesity, MetS, and endothelial damage in non-PA patients than aldosterone or renin alone. Prospective studies are needed to develop future screening cutoff values.

Keywords

Aldosterone, Aldosterone/renin ratio, Blood pressure, Hypertension, Metabolic síndrome, Primary aldosteronism