Is High Prorenin Levels Related to Relative Aldosterone Excess?

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To the Editor: We read with great interest the article titled “Plasma Levels of Prorenin and Renin in Blacks and Whites: Their Relative Abundance and Associations with Plasma Aldosterone Concentration” by Tu et al.¹ They demonstrated no difference in prorenin levels between white and black race groups despite the fact that plasma renin concentration/activity was lower in the black race group compared to that in whites. Moreover, they indicated a negative association between prorenin levels and aldosterone levels in the black race group. However, despite lower aldosterone levels, aldosterone-to-plasma renin activity ratio (ARR) in the black race group tended to be higher than that in whites.

Compared with aldosterone levels alone, assessments of the ARR are more reproducible and could be an index for inappropriate aldosterone activity and salt sensitivity. In fact, we previously demonstrated that high ARR, and not aldosterone levels, was significantly associated with hypertension based on home blood pressure measurements² and was associated with an increased risk of stroke³ in an Asian population with high sodium intake. These results suggest that high ARR is more strongly related to hypertension or cardiovascular disease compared with aldosterone levels.²,³ Therefore, in the study by Tu et al.,¹ there is a possibility that prorenin is positively associated with ARR. However, the detailed relationship between prorenin levels and ARR was not described in their study.

In patients with salt-sensitive hypertension, the normal decline in nocturnal blood pressure is diminished, which is generally referred to as a “nondipping” pattern.⁴ We previously found that high ARR, but not aldosterone levels, was associated with this nondipping pattern in individuals with high sodium excretion.⁵ Based on the results of our previous studies,²,³,⁵ it could be hypothesized that high ARR (i.e., relative aldosterone excess) is associated with salt-sensitive hypertension. In the state of relative aldosterone excess, aldosterone does not fully decrease, despite the fact that renin activity is suppressed by sodium-volume overload, causing inappropriate sodium and fluid retention under the condition of high sodium intake. This mechanism may be responsible for salt-sensitive hypertension due to relative aldosterone excess. However, if prorenin levels are related to high ARR, prorenin may also have an important role in the association between ARR and salt-sensitive hypertension.

Therefore, it would be interesting to determine the association between prorenin and ARR after stratifying study participants according to race and to determine the association between ARR and blood pressure. Moreover, characterization of the association between ARR and blood pressure before and after adjustment for prorenin levels (provided ARR is significantly associated with blood pressure) could help clarify the role of relative aldosterone excess in salt-sensitive hypertension.

DISCLOSURE

The authors declared no conflict of interest.

REFERENCES