Urinary sodium potassium ratio is associated with clinical success after adrenalectomy in patients with unilateral primary aldosteronism

Ther Adv Chronic Dis

2021, Vol. 12: 1–2

DOI: 10.1177/20406223211022650

Rui Zhu, Teresa Maria Seccia and Gian Paolo Rossi

To the Editor,

Lee *et al*. should be commended for investigating whether urinary sodium potassium (uNaK) ratio could predict the clinical outcome of patients with unilateral primary aldosteronism (uPA) who have undergone adrenalectomy.[1] They concluded that uPA patients with a lower uNaK ratio would have better post-surgical clinical success. However, in our view, this conclusion should be made with caution for multiple reasons.

First, the post-operative plasma aldosterone concentrations (PAC) found in their adrenalectomized uPA patients were much higher than 5 ng/dl (139 pmol/l) – the cutoff proposed in the Primary Aldosteronism Surgical Outcome (PASO) consensus to define biochemical success.[2]

The reported median value of 28.5 ng/dl [790 pmol/l, interquartile range (IQR): 20.3–41.1]. These values indicate that a substantial proportion of the patients, likely more than 75%, were not biochemically cured. Moreover, the levels were similarly high in patients with and without clinical success, suggesting that they removed the non-culprit adrenal likely because of failure of unambiguously demonstrating lateralization of aldosterone by adrenal venous sampling (AVS). The inclusion of patients who were not biochemically cured obviously blunted differences between those defined as having chemical success and those without it.

Second, the uNaK ratio is notoriously dependent on daily sodium and potassium intake, as the authors acknowledged. In the uPA patients without clinical success, the daily sodium intake was 3.85 g, which was higher by more than 10% than in the patients with clinical success (3.30 g/day). Thus, when searching for predictors of clinical outcome with logistic regression, electrolyte intake should be taken into consideration, which unfortunately was not done.

Third, numerous factors as known to predict clinical outcome after adrenalectomy, such as duration of hypertension, antihypertensive drugs burden, and vascular remodeling,[3–6] were overlooked.

Finally, the area under a [receiver operating characteristic (ROC)] curve (AUC) – an estimate of accuracy – of the uNaK ratio as a predictor of the clinical outcome, was only 0.571, which did not differ from the AUC under the identity line, indicating that it did not furnish any diagnostic gain for identification of patients with successful clinical outcome over tossing a coin. The authors obtained a higher value of AUC, i.e., 0.747, and thus a higher accuracy only by adding age, sex, estimated glomerular filtration rate (eGFR), body mass index (BMI), renin, and mean blood pressure.

As surgery is not feasible for the most primary aldosteronism (PA) patients, identification of predictors of outcome is admittedly an important field of research. The study by Lee *et al*. is meritorious in that it attempted to explore the usefulness of the uNaK ratio – a simple and inexpensive proxy of patient's adherence to lifestyle measures.[1] However, to determine whether the uNaK ratio does indeed provide an accurate prediction, known existing predictors of surgical outcome in uPA patients would, in our view, need to be considered and the diagnostic gain of adding the uNaK ratio over such already known predictors should more convincingly proven.

Correspondence to:
Gian Paolo Rossi
Clinica dell'Ipertensione Arteriosa –DIMED, University Hospital, via Giustiniani, 2, Padova, 35126, Italy
gianpaolo.rossi@unipd.it

Rui Zhu
International PhD Program in Arterial Hypertension and Vascular Biology (ARHYVAB)- University of Padua, Padua, Italy

Teresa Maria Seccia
Clinica dell'Ipertensione Arteriosa, Department of Medicine – DIMED, University of Padua, Padua, Italy

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Conflict of interest statement

The authors declare that there is no conflict of interest.

ORCID iD

Gian Paolo Rossi https://orcid.org/0000-0002-7963-0931

References

1. Lee MJ, Sun CY, Lu CC, *et al*. Urinary sodium potassium ratio is associated with clinical success after adrenalectomy in patients with unilateral primary aldosteronism. *Ther Adv Chronic Dis* 2021; 12: 2040622321990274.
2. Williams TA, Lenders JWM, Mulatero P, *et al*. Outcomes after adrenalectomy for unilateral primary aldosteronism: an international consensus on outcome measures and analysis of remission rates in an international cohort. *Lancet Diabetes Endocrinol* 2017; 5: 689–699.
3. Rossi GP, Maiolino G, Flego A, *et al*. Adrenalectomy lowers incident atrial fibrillation in primary aldosteronism patients at long term. *Hypertension* 2018; 71: 585–591.
4. Rossi GP, Bolognesi M, Rizzoni D, *et al*. Vascular remodeling and duration of hypertension predict outcome of adrenalectomy in primary aldosteronism patients. *Hypertension* 2008; 51: 1366–1371.
5. Burrello J, Burrello A, Stowasser M, *et al*. The primary aldosteronism surgical outcome score for the prediction of clinical outcomes after adrenalectomy for unilateral primary aldosteronism. *Ann Surg* 2020; 272: 1125–1132.
6. Zarnegar R, Young WF Jr, Lee J, *et al*. The aldosteronoma resolution score predicting complete resolution of hypertension after adrenalectomy for aldosteronoma. *Ann Surg* 2008; 247; 511–518.