Conn’s Syndrome with Normal Plasma Renin Aldosterone Ratio

Myat Thida, Julie Andrew, Julian Barth, Steve Orme
Department of Endocrinology, The Leeds Teaching Hospitals NHS Trust, Leeds, UK

Background

- Conn’s syndrome accounts for 35% of primary hyperaldosteronism.
- Elevated plasma aldosterone concentration to renin activity ratio is widely used as a screening diagnostic tool.
- However, we report an unusual presentation of Conn’s syndrome with normal plasma renin aldosterone ratio.

Clinical presentation & Investigations

- A 48 year old man was seen in endocrine clinic with uncontrolled hypertension and severe hypokalemia. Primary hyperaldosteronism was suspected with blood pressure 170/110 mmHg, serum sodium 145 mmol/l, serum potassium 2.4 mmol/l and metabolic alkalosis with serum bicarbonate 29 mmol/l. Initial plasma renin aldosterone ratio was 290 with aldosterone 320 pmol/l and renin 1.1 nmol/L/h.
- Subsequently blood pressure was controlled and serum potassium was corrected. Repeated plasma renin aldosterone ratio while on doxazosin and normal potassium was again not consistent with Conn’s, having aldosterone 365 pmol/l, renin activity 0.8 nmol/L/h with ratio of 450.
- Abdominal MR scan showed a 1 cm nodule in the right adrenal (see Figure).
- Despite two normal plasma renin aldosterone ratios, clinical suspicion of Conn’s disease led to further investigations. Saline infusion test revealed failure of aldosterone suppression at 225 pmol/l with relatively normal renin aldosterone ratio of 450 post saline infusion.
- Subsequently, he underwent adrenal venous sampling which showed a significant gradient of aldosterone to the right adrenal gland.
- Right adrenal vein aldosterone 21940 pmol/l, cortisol 1630 nmol/l, ratio 13.5; left adrenal vein aldosterone 445 pmol/l, cortisol 1491, ratio 0.3.
- A laparoscopic right adrenalectomy was done.
- Histology confirmed benign adenoma consistent with Conn’s syndrome.
- Two months after surgery, blood pressure was 110/60 mmHg without antihypertensive, serum electrolytes remained normal, normal 24 hour urinary potassium at 85 mmol/day, plasma aldosterone 230 pmol/l, renin activity 2.6 nmol/l/h with aldosterone/renin ratio 88. He was discharged from endocrine clinic.

Conclusion

- Primary hyperaldosteronism can be a diagnostic dilemma for clinicians. Further investigations should be considered if there is strong clinical evidence despite normal plasma renin aldosterone ratio.