Intermittent Primary Aldosteronism-Another Hurdle in the Conn's Story?

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Background

Primary Aldosteronism (PA, sometimes referred to as Conn's syndrome) is a cause for endocrine arterial hypertension. Recent prevalence estimates for PA are 4.8-9.2%[1,2]. Accurate case detection and lateralisation studies are required to determine whether PA is unilateral or bilateral disease. Unilateral disease presents a potentially curable form of hypertension following adrenalectomy. The current diagnostic algorithm[3] recommends using the Aldosterone: Renin Ratio (ARR) as a screening tool, followed by confirmatory testing. We describe three cases where initial confirmatory testing using a saline infusion test (SIT) was negative for PA, which would have led to failure to progress to lateralisation and surgery in 2 of the patients. On repeat testing SIT confirmed PA with a non-suppressed aldosterone (greater than 190pmol/L) following 4hrs post saline infusion.

Case 1

- 60 year old male
- Hypertension
  - BP 172/92
  - Amlodipine, Atenolol, Doxazosin, Spironolactone
- Hypokalaemia

- PA Screening: (4 agents)

Renin	3	mU/L
Aldosterone	405	pmol/L
ARR	135	

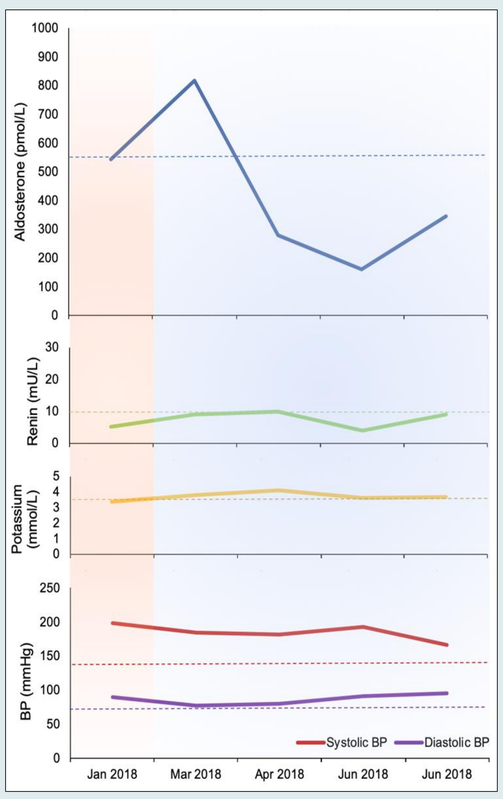
Initial SIT

	Pre-Saline	Post-Saline
Aldosterone	543	<70
Medications	Doxazosin, Amlodipine	

Repeat SIT

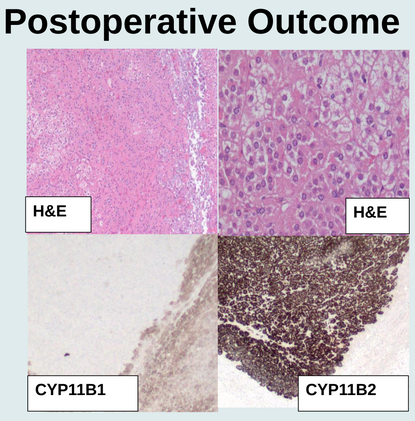
	Pre-Saline	Post-Saline
Aldosterone	818	343
Medications	Doxazosin, Amlodipine, Diltiazem	

Variation in Aldosterone, Renin, Potassium and BP over a 5 month period



CT Findings: Left adrenal 7mm nodule
Lateralisation: Unilateral left adrenal disease
Conclusion: Unilateral left adrenal disease.
Recommend left adrenalectomy.

Postoperative Outcome



Renin	26	mU/L
Aldosterone	74	pmol/L
Potassium	5.6	mmol/L

Clinical
BP 151/92 . On Amlodipine 10mg OD & Doxazosin MR 8mg BD.

Case 2

- 58 year old male
- Hypertension
  - BP 180/110
  - Losartan
- Hypokalaemia

- PA Screening: (Losartan)

Renin	<2	mU/L
Aldosterone	532	pmol/L
ARR	266	

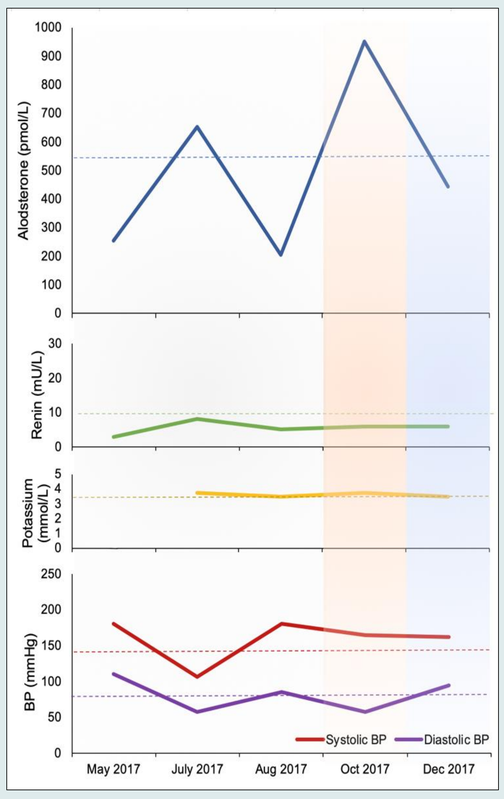
Initial SIT

	Pre-Saline	Post-Saline
Aldosterone	206	<70
Medications	No medications	

Repeat SIT

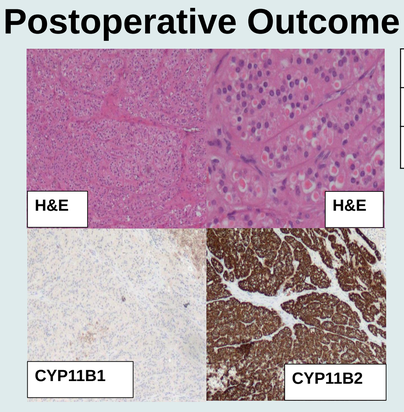
	Pre-Saline	Post-Saline
Aldosterone	951	444
Medications	Doxazosin	

Variation in Aldosterone, Renin, Potassium and BP over a 7 month period



CT Findings: Left adrenal 10mm nodule
Lateralisation: Unilateral left adrenal
Conclusion: Unilateral left adrenal disease.
Recommend left adrenalectomy.

Postoperative Outcome



Renin	47	mU/L
Aldosterone	239	pmol/L
Potassium	3.9	mmol/L

Clinical
BP 116/77 on no regular antihypertensives.

Case 3

- 49 year old male
- Hypertension
  - BP 150/93
  - Verapamil
- No previous hypokalaemia

- PA Screening: (Nil agents)

Renin	5	mU/L
Aldosterone	640	pmol/L
ARR	128	

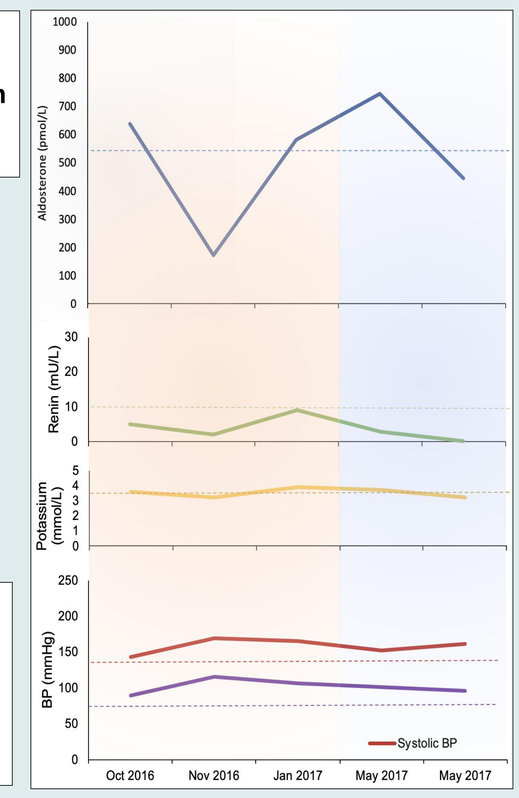
Initial SIT

	Pre-Saline	Post-Saline
Aldosterone	174	114
Medications	Doxazosin, Verapamil	

Repeat SIT

	Pre-Saline	Post-Saline
Aldosterone	444	407
Medications	Doxazosin, Verapamil	

Variation in Aldosterone, Renin, Potassium and BP over a 7 month period



CT Findings: Left adrenal 7mm nodule
Lateralisation: Bilateral disease.
Conclusion: Bilateral disease.
Recommend medical management.

Medical Outcome

Clinical
BP 112/79 on Eplerenone 50mg OD.

Conclusion

- Reliance on single timepoint testing may lead to failure to proceed to confirmatory testing due to aldosterone level variability in PA.
- Repeat testing should be considered in patients with a high pre-test probability for PA (young onset or refractory hypertension, unprovoked hypokalaemia, adrenal adenoma) who have a negative initial SIT.

References

1. Rossi GP, Bernini G, Caliumi C, Desideri G, Fabris B, Ferri C, et al. A Prospective Study of the Prevalence of Primary Aldosteronism in 1,125 Hypertensive Patients. J Am Coll Cardiol. 2006 Dec;48(11):2293–300.
2. Lim P, Dow E, Brennan G, Jung R, MacDonald T. High prevalence of primary aldosteronism in the Tayside hypertension clinic population. J Hum Hypertens. 2000 May 10;14:311.
3. Funder JW, Carey RM, Fardella C, Gomez-Sanchez CE, Mantero F, Stowasser M, et al. Case Detection, Diagnosis, and Treatment of Patients with Primary Aldosteronism: An Endocrine Society Clinical Practice Guideline. J Clin Endocrinol Metab. 2008 Sep;93(9):3266–81.

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Adrenal and steroids
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