A review on a modified adrenal venous sampling (AVS) protocol for patients who have history of allergy and required steroid cover for iodinated contrast

Dr. KA SHING YAN
Department of Medicine, Pamela Youde Nethersole Eastern Hospital, Hong Kong

Background

Adrenal venous sampling (AVS) is the gold standard to determine laterality of primary hyperaldosteronism. However, steroid given as a premedication for those required will make biochemical data uninterpretable. Our hospital designed a modified protocol for this group of patients using Dexamethasone and Tetracosactide, and we have been using it since 2008.

Objective

Our primary objective is to assess the accuracy and safety of this modified protocol as compared with non-stimulated protocol in identifying unilateral form of primary hyperaldosteronism by evaluating the clinical (post-operative blood pressure and anti-hypertensives requirement) and biochemical response (potassium level and post-operative aldosterone-renin ratio (ARR)) of these patients after surgery, as well as any adverse events during and after the procedure.

Methodology

Patients who underwent AVS in the period of 1/1/2008 to 31/12/2019 in Pamela Youde Nethersole Eastern Hospital (PYNEH) with subsequent unilateral adrenalectomy were reviewed. Total 44 patients were included in this retrospective study. Information of patients were extracted through Clinical Data Analysis and Reporting System (CDARS) of the Hospital Authority of Hong Kong. Statistical analysis used were Statistical Package for the Social Sciences (SPSS) software.

Results

The International consensus for outcomes after adrenalectomy for unilateral primary aldosteronism published in 2017 was used to determine the outcomes of all surgical cases included. For the positive predictive value (PPV) for clinical benefit (partial or complete clinical success), the non-stimulated protocol was up to 96.77%, while the modified protocol was 100%. Both groups achieved normal potassium level after operation. For the available ARR, the PPV for biochemical success for both protocols was 100%. There were no adverse events for all 33 cases of AVS using the modified protocol.

Conclusion

Our modified protocol can be a feasible and safe way for patients who have contrast allergy and need to undergo AVS.

Keywords: adrenal venous sampling, modified protocol, contrast allergy

Table 1. Comparison of baseline characteristics of patients underwent AVS using the 2 protocols with adrenalectomy

	Non-stimulated protocol (n = 31)	Modified protocol (n = 13)	p value
Gender			0.496
Male	21(67.74%)	7(53.85%)	
Female	10(32.26%)	6(46.15%)	
Age at operation	54.45+/-8.61	55.38+/-10.27	0.757
Body weight (kg)	73.73+/-14.90	67.82+/-10.24	0.200
Diabetes mellitus	5(16.13%)	5(38.46%)	0.131
Cardiovascular disease	4(12.90%)	0	0.677
Years of HT before OT	9.13+/-6.15	10.53+/-7.42	0.518
No of anti-hypertensives before OT	2.35+/-0.98	2.31+/-1.11	0.672
No of Slow K before OT	5.32+/-2.95	4.46+/-3.48	0.270
ARR before OT (pmol/L per ng/mL/hr)	2654 (1933-3420)	2395 (1311-3827)	0.929

Method

Step 1 CDARS
All patients underwent AVS in PYNEH in the period 1/1/2008 to 31/12/2019

Step 2
Information review in CMS or from medical records from Medical Records Office

Step 3 Classification
Total 144 AVS
Modified protocol: 33
Non-stimulated protocol: 111

Modified protocol patients underwent unilateral adrenalectomy: 13
11 cases with successful bilateral cannulation and confirmed unilateral hypersecretion
2 cases with successful unilateral cannulation which could guide adrenalectomy decision

Non-stimulated protocol patients underwent unilateral adrenalectomy: 32
19 cases with successful bilateral cannulation and confirmed unilateral hypersecretion
10 cases with successful unilateral cannulation which can guide adrenalectomy decision
2 cases with less than ideal cortisol gradient but can guide adrenalectomy decision
1 case non conclusive

Step 4
Include
All cases in which AVS results could guide adrenalectomy decision
Exclude
Non conclusive case which did not guide adrenalectomy decision

Step 5
Review the surgical outcome of patients using these two protocols

Table 2. Comparison of clinical and biochemical outcomes for patients using the 2 AVS protocols after adrenalectomy

	non-stimulated protocol (n = 31)	modified protocol (n = 13)	p value
No of anti-hypertensives before OT	2.35+/-0.98	2.31+/-1.11	0.672
No of anti-hypertensives after OT	1.06+/-1.21	1.08+/-1.12	0.975
No of patients with optimal BP near 3 months	28/31 (90.32%)	13 (100%)	0.544
No of patients with optimal BP near 6 months (for data available) a	27/28 (96.43%)	13 (100%)	0.677
No of patients with optimal BP near 12 months (for data available) b	25/25 (100%)	13 (100%)	0.157
No of Slow K tablets before OT	5.32+/-2.95	4.46+/-3.48	0.270
No of Slow K tablets after OT	0	0	
ARR before OT (pmol/L per ng/mL/hr)	2654 (1933-3420)	2395 (1311-3827)	0.929
ARR after OT (for data available) (pmol/L per ng/mL/hr) c	80.5 (28-170.5)	162 (133-235)	0.378

a BP was not available in 3 patients in the non-stimulated protocol. One had recent surgery and did not reach 6 months or 12 months post-surgery. Blood pressure was not properly documented during follow-up in 2 patients.
b BP was not available in 6 patients in the non-stimulated protocol. Five had recent surgery and did not reach 6 months or 12 months post-surgery. Blood pressure was not properly documented during follow-up in 1 patient.
c ARR were not available in 7 patients in the non-stimulated group as they no longer followed up in our hospital before the review.