



Primary Hyperaldosteronism: Predictors of Response to Therapy in Singapore

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Background

Primary hyperaldosteronism is a common cause of secondary hypertension, accounting for up to 5% of cases locally. It is treated medically with spironolactone and/or amiloride, or surgically with adrenalectomy. This study determines the prognostic factors for response to treatment, resulting in reduction of blood pressure to normotensive levels.

Methods

We retrospectively reviewed records of 57 patients who were diagnosed with primary hyperaldosteronism by a saline suppression test, and subsequently underwent treatment. The patients were divided into 2 groups – hypertensive and normotensive (WHO:<140/90), based on their blood pressure readings at 1 year since starting treatment. We collected baseline characteristics of both groups, including patient demographics – age, gender, race, BMI, as well as medical comorbidities, use of anti-hypertensive medications, and results of screening and diagnostic tests, and compared them via multivariate analysis.

Results

At 1 year post treatment, 28 (49.1%) patients were normotensive, and 29 (50.9%) were hypertensive. We found that the hypertensive group had more person-years of diabetes (mean=2.52 vs 0.41, $p<0.05$), and also had a higher baseline aldosterone level (mean=749.15 vs 532.61, $p<0.05$), than the normotensive group.

Other factors, including the patient age, gender, race, BMI, baseline blood pressure, years of hypertension, number and type of anti-hypertensive medications, baseline creatinine, potassium, sodium, renin, saline suppression test results, treatment type, presence of adenoma on CT scan, did not differ significantly between the 2 groups.

Discussion

In patients with primary hyperaldosteronism based on a positive normal saline suppression test, predictors for achieving normotension with treatment include not having or having fewer years of diabetes, and having a lower baseline aldosterone level. This knowledge is helpful for physicians to prognosticate response to treatment in newly diagnosed patients.

Table 1. Bivariate analysis for normotension vs hypertension

Characteristic	Primary Hyperaldosteronism (+ve Saline Suppression Test) n=54		p-value	
	Normotensive at 1 year (n=28)	Hypertensive at 1 year (n=29)		
Mean (S.D) OR n(%)				
Demographics				
Age	53.93 (9.257)	53.45 (10.200)	0.853	
Gender	M	18 (51.4)	17 (48.6)	0.661
	F	10 (45.5)	12 (54.5)	
Biophysical Profile				
Height	1.62 (0.09846)	1.6162 (0.09417)	0.888	
Weight	68.932 (21.5351)	64.494 (15.0663)	0.376	
BMI	27.8782 (7.84658)	27.2461 (12.08306)	0.831	
Obesity	Y	5 (38.5)	8 (61.5)	0.526
	N	18 (48.6)	19 (51.4)	
Comorbidities				
History of Diabetes	Y	7 (38.9)	11 (61.1)	0.294
	N	21 (53.8)	18 (46.2)	
Years of Diabetes	0.414 (1.1936)	2.517 (5.0630)	0.037	
Systolic BP on first visit	157.29 (22.894)	159.00 (27.059)	0.798	
Diastolic BP on first visit	86.0000 (18.60705)	88.4138 (15.67645)	0.598	
MAP on first visit	109.7619 (16.75528)	115.2529 (20.58175)	0.275	
Years of Hypertension	8.5192 (6.32532)	10.9615 (8.20966)	0.235	
Initial Drug History				
No of HTN drugs	2.1786 (0.90487)	2.2414 (1.02313)	0.807	
Baseline Biochemistry				
Creatinine	83.3333 (29.58690)	89.2414 (29.12370)	0.455	
Potassium	3.1259 (0.80984)	3.0621 (0.60793)	0.739	
Hypokalemic	Y	9 (56.3)	7 (43.8)	0.501
	N	19 (46.3)	22 (53.7)	
Sodium	142.5714 (6.42317)	141.2963 (2.31741)	0.344	
Aldosterone	532.6107 (246.91117)	749.1483 (305.94430)	0.005	
Renin	0.2686 (0.23338)	0.4859 (0.72591)	0.135	
Screening Test				
ARR Ratio	275.7297 (533.52225)	421.6122 (549.31448)	0.314	
Saline Suppression Test				
Pre-test aldosterone	595.0800 (321.22862)	670.5179 (284.36106)	0.369	
Post-test aldosterone	469.4107 (177.28044)	578.12767 (314.74491)	0.114	
Treatment Type				
Medical	23 (46.9)	26 (53.1)	0.414	
Surgical	5 (62.5)	3 (37.5)		
CT Abdo-Pelvis				
Adenoma present	Y	16 (44.4)	20 (55.6)	0.420
	N	8 (57.1)	6 (42.9)	
Adenoma dimensions	1.0400 (0.90504)	0.9085 (0.56916)	0.538	
Adenoma surface area	1.2168 (1.59120)	0.8518 (0.61784)	0.308	
6 months Outcome				
Potassium	4.3321 (0.60556)	4.1069 (0.44636)	0.115	
Systolic BP	132.5357 (14.37972)	143.5172 (22.82796)	0.034	
Diastolic BP	76.3214 (9.82082)	81.8966 (14.69048)	0.097	
MAP	95.0595 (9.22604)	102.4368 (15.10495)	0.030	

Table 2. Multivariate analysis for normotension vs hypertension

Characteristic	Primary Hyperaldosteronism n=54		p-value
	Normotensive at 1 year (n=28)	Hypertensive at 1 year (n=29)	
Mean (S.D) OR n(%)			
Years of Diabetes	0.414 (1.1936)	2.517 (5.0630)	0.043
Baseline Aldosterone	532.6107 (246.91117)	749.1483 (305.94430)	0.004

References

- Milsom SR, Espiner EA, Nicholls MG, et al. The blood pressure response to unilateral adrenalectomy in primary aldosteronism. Q J Med 1986; 61:1141.
- Mattsson C, Young WF Jr. Primary aldosteronism: diagnostic and treatment strategies. Nat Clin Pract Nephrol 2006; 2:198.

