

알도스테론 차단제를 이용한 고혈압 조절에서 만성콩팥병 유무에 따른 고칼륨혈증 발생의 예측인자

고신대학교 의과대학 내과학교실

구상건, 김예나, 임선영, 신호식, 정연순, 임학

Predictors of Hyperkalemia Risk Following Hypertension Control with Aldosterone Blockade According to the Presence or Absence of Chronic Kidney Disease

Sangeon Gwoo, Ye Na Kim, Sun Young Lim, Ho Sik Shin, Yeon Soon Jung, Hark Rim

Department of Internal Medicine, Kosin University College of Medicine

Background: Aldosterone antagonists have proven efficacy for the management of hypertension and reduction of proteinuria; however, they are not widely used because of the risk of hyperkalemia. We assessed the predictors of hyperkalemia risk following hypertension control using aldosterone blockade according to the presence or absence of chronic kidney disease (CKD).

Methods: Patients used in the analysis were observed between January 1, 2000 and November 30, 2012. A total of 6,575 patients with hypertension were evaluated for the safety of an aldosterone blockade added to preexisting blood pressure-lowering regimens. Hyperkalemia was defined as serum K level >5.0 mEq/L. All patients were on 3 mechanistically complementary antihypertensive agents, including a diuretic and a renin-angiotensin system blocker. Patients were evaluated after 4 and 8 weeks of treatment. The incidence of hyperkalemia, significant renal dysfunction (a reduction of estimated glomerular filtration rate [eGFR] $\geq 30\%$), and adverse effects according to the presence or absence of CKD were assessed.

Results: After 4 weeks of treatment, the incidence of hyperkalemia according to the presence or absence of CKD was 6.9% and 36.6%, respectively. After 8 weeks of treatment, the incidence of hyperkalemia (serum K level ≥ 5.0 mEq/L) according to the presence or absence of CKD was 0.5% and 2.6%, respectively. According to logistic regression for predicting hyperkalemia following aldosterone antagonism, old age, CKD, male sex, basal hyperkalemia, and a reduction in eGFR predicted hyperkalemia risk.

Conclusion: Spironolactone was well tolerated in selected patients with CKD. The risks of serious hyperkalemia or significant renal deterioration appear to be low, particularly after the second month of treatment. Strict monitoring over the first month of treatment followed by standard surveillance as for angiotensin converting enzyme inhibitors and angiotensin II receptor blockers is suggested.

Key Words: 알도스테론, 고혈압, 칼륨, 만성콩팥병

Aldosterone, Hypertension, Potassium, Chronic kidney disease

Table 1. Baseline characteristics

Demographic variables	
Male gender	3730 (56.7%)
DM	2323 (39.9%)
CKD stage 3 or 4	869 (13.2%)
Number of antihypertensives	4 (3-5)
Any RAS blockade	1617 (24.6%)
Any diuretics	3545 (53.9%)
Laboratory values	
Serum creatine (mg/dL)	0.93 \pm 0.46
eGFR (mL/min/1.73 m ²)	90.5 \pm 43.9
Serum Potassium (meq/L)	4.1 \pm 0.5

Table 2. Logistic Regression for Predicting Hyperkalemia following aldosterone antagonism

Variable	OR (95% CI)	P value
Age > 65 years	1.097 (0.955-1.260)	0.190
Chronic Kidney Disease	2.150 (1.761-2.625)	0.001
Male	1.149 (1.279-1.688)	0.001
Serum potassium > 5.0 mEq/L	2.412 (1.782-3.265)	0.001
> 30% reduction in eGFR	4.918 (4.231-5.716)	0.001