Atrial fibrillation is an independent predictor of cardiovascular events in patients with primary aldosteronism

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Background: A higher risk of cardiovascular events has been reported in patients with hypertension due to primary aldosteronism (PA) than essential hypertension. This study sought to determine the independent predictors for the risk of cardiovascular events in hypertensive patients with PA.

Methods: The Japan Primary Aldosteronism Study (JPAS) has retrospectively recruited 3,654 patients with PA between January 2006 and January 2019 as a nationwide registry and we evaluated the differences between patients with and without AF from these data. The patients underwent general laboratory test, electrocardiography, echocardiography, diagnostic confirmatory tests including saline-loading, captopril-challenge, and upright furosemide-loading tests and adrenal venous sampling (AVS).

We evaluated the cardiovascular events including myocardial infarction, stroke, heart failure and renal failure, with a mean follow-up duration of approximately 4 years.

Results: The prevalence of AF was 2.4% (88/ 3,654). PA patients with AF were older (60.3 vs 52.8 years old), more male (77.3% vs 46.6%) and had longer duration of hypertension (14.3 vs 8.3 years) than those without AF. Each prevalence of cerebral infarction (12.5% vs 3.5%), chronic kidney disease (12.5% vs 4.8%), coronary artery disease (CAD) (10.2% vs 1.7%), heart failure (5.7% vs 0.7%) and left ventricular hypertrophy evaluated by echocardiography (46.4% vs 31.9%) was higher in PA patients with AF. Patients with AF had more kinds of antihypertensive drugs (1.3 vs 1.1). There was no significant difference of basal plasma aldosterone concentration (PAC), plasma renin activity, each confirmatory tests, lateralized ratio in AVS after stimulation with adrenocorticotropic hormone (ACTH) and laterality between the 2 groups. Logistic regression analysis showed that age, cardiothoracic ratio (CTR), past history of CAD and heart failure were independent determinants for AF. PA patients with AF had higher rates of cardiovascular events compared to those without AF (Figure, $P<0.005$). Multivariate Cox regression analyses demonstrated AF in addition to adrenal PAC before ACTH stimulation, age, hypokalemia and duration of hypertension as independent prognostic factors for cardiovascular events (hazard ratio [HR] 1.993, 95% confidence interval [CI] 1.042–3.815, $P<0.05$; HR 1.000008, 95% CI 1.000004–1.000012, $P<0.0005$; HR 1.03, 95% CI 1.012–1.048, $P<0.005$; HR 1.748, 95% CI 1.242–2.461, $P<0.005$; HR 1.029, 95% CI 1.013–1.044, $P<0.0005$, respectively).

Conclusions: This study provides evidence that comorbid AF is associated with older age, male sex, X-ray CTR and prevalence of CAD and heart failure. Furthermore, AF is an independent predictor of cardiovascular events in patients with PA, in addition to the adrenal venous concentration of aldosterone, hypokalemia, older age and duration of hypertension. Earlier recognition and intervention of AF can prevent cardiovascular events in PA.

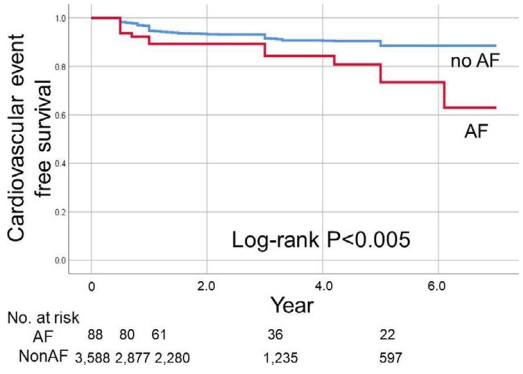

Figure 1