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Acute Coronary Syndromes – Epidemiology, Prognosis, Outcome

Role of diuretics on long-term mortality may differ in volume status in patients with acute myocardial infarction

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Background: Diuretics has been reported to have a potential for an activation of the renin-angiotensin-aldosterone system and the sympathetic nervous system, leading to a possibility of poor clinical outcome in patients with cardiovascular disease. However, few data are available on clinical impact of diuretics on long-term outcome in patients with acute myocardial infarction (AMI) based on plasma volume status.

Methods: To address the issue, a total of 3,416 survived patients with AMI who were registered to a large database of the Osaka Acute Coronary Insufficiency Study (OACIS) were studied. Plasma volume status was assessed with the estimated plasma volume status (ePVS) that was calculated at discharge as follows: actual PV = (1 – hematocrit) × [a + (b × body weight)] (a=1530 in males and a=864 in females, b=41.0 in males and b=47.9 in females); ideal PV = c × body weight (c=39 in males and c=40 in females), and ePVS = [(actual PV – ideal PV)/ideal PV] × 100 (%). Multivariable Cox regression analysis and propensity score matching were performed to account for imbalances in covariates. The endpoint was all-cause of death (ACD) within 5 years.

Results: During a median follow-up period of 855±656 days, 193 patients had ACD. In whole population, there was no significant difference in long-term mortality risk between patients with and without diuretics in both multivariate cox regression model and propensity score matching population. When patients were divided into 2 groups according to ePVS with a median value of 4.2%, 46 and 147 patients had ACD in groups with low ePVS and high ePVS, respectively. Multivariate Cox analysis showed that use of diuretics was independently associated with an increased risk of ACD in low ePVS group, (HR: 2.63, 95% confidence interval [CI]: 1.22–5.63, p=0.01), but not in high ePVS group (HR: 0.70, 95% CI: 0.44–1.10, p=0.12). These observations were consistent in the propensity-score matched cohorts; the 5-year mortality rate was significantly higher in patients with diuretics than those without among low ePVS group (4.7% vs 1.7%, p=0.041), but not among high ePVS group (8.0% vs 10.3%, p=0.247).

Conclusion: Prescription of diuretics at discharge was associated with increased risk of 5-year mortality in patients with AMI without PV expansion, but not with PV expansion. The role of diuretics on long-term mortality may differ in plasma volume status. Therefore, prescription of diuretics after AMI may be considered based on plasma volume status.