Prognostic Impact of Early Sinus Rhythm Restoration in Critically Ill Patients with Atrial Fibrillation

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**Introduction**: New-onset atrial fibrillation (NOAF) is a common arrhythmia in patients hospitalized in intensive care units (ICUs). NOAF is associated with increased morbidity and mortality in critical cares. However, the prognostic impact in critically ill patients with NOAF remains unclear.

**Methods**: A total of 4170 patients who were admitted to ICUs at Inha university hospital from January 2014 to December 2016 were retrospectively reviewed. Of them, 226 (mean follow-up duration, 10.343 ± 13.624 months) were eligible for our study. The patients were divided into three groups according to sinus rhythm (SR) restoration or rate control (<110bpm) within 48 hours from NOAF with rapid ventricular response (RVR) development: group 1; SR restoration with rate control (n=88), group 2; only controlled ventricular rate without SR restoration (n=75) and group 3; poorly controlled ventricular rate (n=63) group.

**Result**: There were no differences of age (73.1 ± 9.2 years vs. 71.8 ± 11.5 years vs. 70.1 ± 12.7 years, P=0.255), sex (55.7% vs. 61.3% vs. 47.6% for male, P=0.271) and mean CHA2DS2-VASc score (3.3 ± 1.7 vs. 2.9 ± 1.7 vs. 3.0 ± 1.6, P=0.251) among each groups. During follow-up duration, group 1 and group 2 had a shorter ICU length of stay (LOS) than group 3. Kaplan-Meier estimates showed significant differences in all-cause mortality in ICUs and in-hospital between group 2 and group 3 (each P < 0.05). During mean 10 follow-up months, Kaplan-Meier estimates showed a significant difference in survival probability between group 1 and group 3, group 2 and group 3 (each P <0.001). In Cox proportional hazard models, ICU LOS (hazard ratio [HR] 2.434, 95% confidence interval [CI] 1.343-4.410, P=0.003) and controlled ventricular rate (HR 3.635, 95% CI 1.931-6.839, P < 0.001) were independently associated with all-cause mortality.

**Conclusion**: In critically ill patients with NOAF, longer ICU LOS and poorly controlled ventricular rate were prognostic factors of all-cause mortality. Patients with stabilization of RVR and early SR restoration showed better long-term survival outcome compared to patients with poorly controlled rate.