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Predicting Factors, Incidence and Prognosis of Cardiac Arrhythmia in Medical, Non-Acute Coronary Syndrome, Critically Ill Patients

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Abstract

Background: Cardiac arrhythmia is an important complication of critically ill patients, especially in perioperative period and early after myocardial infarction. However, the information regarding this condition in medical critically ill without active coronary artery disease patients is limited.
Objective: To identify the predictive factors, incidence, and prognosis of tachyarrhythmia and bradyarrhythmia in noncoronary critically ill medical patients.
Material and Method: A single center, prospective cohort study, included medical critically ill patients, age > 18 year-old, admitted in a 15-bed medical ICU between September 2010 and August 2011. The patients with active coronary artery disease, end stage organ failure and not expected to survive > 48 hours were excluded. The patients' baseline characteristic, APACHE II score, laboratory investigations in the first 24 hours and treatment modalities were recorded. Continuous electrocardiographic monitoring was performed during ICU admission. The arrhythmic event, requiring treatment, was recorded.
Results: A total of 247 patients were included, the mean age was 58.5 + 20.0 year-old and mean APACHE II score was 20.1 + 9.8. Most of them had septic shock (57.1%) and respiratory failure (55.1%). The incidence of arrhythmia was 39.7%. Of 45 patients (18.2%) who had tachyarrhythmia, new onset atrial fibrillation was demonstrated in 34 patients (13.8%), following by ventricular fibrillation (9 patients, 3.6%) and supraventricular tachycardia (2 patients, 0.8%). Bradyarrhythmia was noted in 53 patients (21.5%). Of these, junctional bradycardia was witnessed in 34 patients (13.8%), followed by symptomatic bradycardia (15 patients, 6.1%) and atrioventricular blockage (4 patients, 1.6%). The multivariate by logistic regression analysis revealed the receiving of norepinephrine and APACHE II > 25 as an independent predictor for tachyarrhythmia, while the receiving of norepinephrine, arterial pH < 7.3 and HCO3 > 18 were associated with bradyarrhythmia. The presence of arrhythmia, especially ventricular fibrillation, symptomatic sinus bradycardia and junctional bradycardia in medical ICU is associated with higher hospital mortality (bradyarrhythmia 88.7%, tachyarrhythmia 66.7%) than the absent group (18.1%, $p < 0.001$).
Conclusion: Arrhythmia is a serious complication of medical critically ill patients and associated with high mortality rate. Appropriate shock management together with proper metabolic support may prevent this condition.

Keywords: Cardiac arrhythmia, Atrial fibrillation, Ventricular fibrillation, Ventricular tachycardia, Bradyarrhythmia, Junctional bradycardia, Medical critically ill patient

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