Atrial Fibrillation (AF) - Epidemiology, Prognosis, Outcome

Simple clinical parameters could help to identify the patients with a high probability of new-onset atrial fibrillation in acute myocardial infarction

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Background: New-onset atrial fibrillation (NOAF) is a significant complication of acute myocardial infarction (AMI) associated with a poor prognosis. The knowledge and understanding of risk factors of this arrhythmia are still the subjects of interest. Purpose: We aimed to investigate which clinical, routinely checked parameters could have the most predictive power on NOAF occurrence in AMI patients.

Patients and methods: This single-center, retrospective study was conducted on 954 consecutive patients admitted to our university clinical center with AMI diagnosis from January 2017 to December 2018. Patients underwent routine clinical assessment and laboratory investigations. AF detected at the time of admission or during a hospital stay, without a prior history of persistent or paroxysmal AF, was diagnosed as NOAF. Detailed medical history, routinely checked laboratory and echocardiography parameters, invasive and pharmacological treatment, as well as complications and in-hospital mortality, were taken into consideration.

Results: NOAF was documented in 106 (11%) AMI patients at median age 74 (66 - 84) years old, and was significantly associated with in-hospital mortality [OR 4.53, $p < 0.001$). There were some clinical factors significantly predicted NOAF in univariate logistic regression analysis: age $\geq$ 66 years old (odds ratio [OR] 3.09, $p < 0.001$), B-type natriuretic peptide (BNP) $\geq$ 340 pg/ml (OR 5.28, $p < 0.001$), C- reactive protein (CRP) $\geq$ 7.7 mg/l (OR 3.53, $p < 0.001$), high-sensitivity troponin $\geq$ 1.85 ng/ml (OR 2.4, $p < 0.001$), total cholesterol $\leq$ 195 mg/dl (OR 2.17, $p < 0.002$), low-density lipoprotein $\leq$ 128.5 mg/dl (OR 2.03, $p < 0.007$), potassium level $\leq$ 4.2 mmol/l (OR 1.92, $p < 0.002$), hemoglobin $\leq$ 14 g/dl (OR 1.71, $p < 0.020$), leucocytes $\geq$ 10.2 x10^9/l (OR 1.76, $p < 0.009$), neutrophil to lymphocyte ratio $\geq$ 4.6 (OR 1.85, $p < 0.004$), left atrium size $\geq$ 41 mm (OR 2.14, $p < 0.001$), and left ventricular ejection fraction (LVEF) $\leq$ 44% (OR 2.99, $p < 0.001$). Age, BNP, CRP, and LVEF at mentioned above pre-specified cut-off values turned out to be the most important independent predictors of NOAF development in multivariate analysis.

Conclusions: NOAF is a multifactorial, significant complication of AMI, leading to a worse prognosis. Older age, higher BNP and CRP level, and lower LVEF are independently associated with the probability of NOAF.