ORIGINAL ARTICLE

New-onset atrial fibrillation during acute coronary syndromes: Predictors and prognosis

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Abstract
Introduction: New-onset atrial fibrillation (AF) frequently complicates myocardial infarction, with an incidence of 6–21%.
Objective: To assess the predictors and prognosis of new-onset AF during acute coronary syndromes (ACS).
Methods: We performed a retrospective observational cohort study including 902 consecutive patients (mean age 64 years, 77.5% male) admitted to a single center over a two-year period, with a six-month follow-up.
Results: AF rhythm was identified in 13.8% patients, of whom 73.3% presented new-onset AF and 26.8% pre-existing AF. New-onset AF was more frequent in older ($p<0.001$) and hypertensive patients ($p=0.001$) and in those with previous valvular heart disease ($p<0.001$) and coronary artery bypass grafting ($p=0.049$). During hospitalization, patients with new-onset AF more often had respiratory infection ($p=0.002$) and heart failure ($p<0.001$), and higher values of NT-proBNP ($p=0.007$) and peak creatinine ($p=0.001$). On echocardiography they had greater left atrial (LA) diameter ($p<0.001$) and more frequent significant mitral regurgitation ($p<0.001$) and left ventricular ejection fraction (LVEF) $\leq40\%$ ($p<0.001$) and were less likely to have significant coronary lesions ($p=0.009$) or to have undergone coronary revascularization ($p<0.001$). In multivariate analysis, age (OR 1.06, $p=0.021$), LVEF $\leq40\%$ (OR 4.91, $p=0.002$) and LA diameter (OR 1.14, $p=0.008$) remained independent predictors of new-onset AF. Together with age, diabetes and maximum Killip class, this arrhythmia was an independent predictor of overall mortality (OR 3.11, $p=0.032$).

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Conclusions: Age, LVEF ≤40% and LA diameter are independent predictors of new-onset AF during ACS. This arrhythmia is associated with higher overall mortality (in-hospital and in follow-up).
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Fibrilhação auricular de novo no contexto das síndromes coronárias agudas – preditores e prognóstico

Resumo
Introdução: A fibrilhação auricular (FA) de novo complica frequentemente o enfarte agudo do miocárdio, tendo uma incidência entre 6-21%.
Objetivos: Determinar os preditores e prognóstico da FA de novo nas síndromes coronárias agudas (SCA).
Métodos: Estudo retrospetivo observacional de coorte, incluindo 902 doentes consecutivos (idade média: 64 anos; 77,5% homens), admitidos num hospital, durante dois anos, com follow-up de seis meses.
Resultados: O ritmo de FA foi identificado em 13,8% doentes, dos quais 73,3% apresentaram FA de novo e 26,8% FA pré-existente. A FA de novo ocorreu mais nos idosos (p < 0,001), hipertensos (p = 0,001), doentes com história de patologia valvular (p < 0,001) e cirurgia de revascularização miocárdica (p = 0,049). No internamento, verificou-se maior incidência de infeção respiratória (p = 0,002) e insuficiência cardíaca (p < 0,001). Aferiram-se valores superiores de NT-proBNP (p = 0,007) e creatinina pico (p = 0,001). Na avaliação ecocardiográfica observou-se um diâmetro superior da aurícula esquerda (AE; p < 0,001), maior prevalência de insuficiência mitral significativa (grau ≥ II/IV; p < 0,001) e fração de ejeção ventricular esquerda ≤ 40% (FEVE ≤ 40%; p < 0,001). Documentou-se ausência de lesões coronárias significativas (p = 0,009) e não-revascularização coronária (p < 0,001). Na análise multivariada, a idade (OR 1,06, p = 0,021), a FEVE ≤ 40% (OR 4,91, p = 0,002) e o diâmetro da AE (OR 1,14, p = 0,008) permaneceram preditores independentes da FA de novo. Juntamente com a idade, diabetes, e classe de Killip máxima, a FA de novo foi preditora independente da mortalidade global (OR 3,11, p = 0,032).
Conclusões: A idade, FEVE≤40% e diâmetro da AE são preditores independentes da FA de novo durante as SCA. Esta arritmia acarreta uma maior mortalidade global (mortalidade intra-hospitalar e durante o seguimento).
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List of abbreviations

ACS	acute coronary syndromes
AF	atrial fibrillation
LA	left atrial
LV	left ventricular
LVEF	left ventricular ejection fraction
MI	myocardial infarction

Introduction

Atrial fibrillation (AF), the most commonly encountered clinical arrhythmia, often occurs in the setting of myocardial infarction (MI), with a reported incidence between 6 and 21%.[1] New-onset AF should be differentiated from pre-existing AF, since they may have different clinical and therapeutic implications.[2,3] Nevertheless, the presence of AF is associated with a high risk of heart failure and mortality in MI patients, regardless of its timing.[4] During AF, rapid and irregular ventricular rates, inadequate ventricular filling and loss of atrial contribution to cardiac output lead to an increase in oxygen demand, causing further impairment in coronary perfusion and left ventricular (LV) systolic function.[5] Factors precipitating AF during acute coronary syndromes (ACS) include atrial ischemia or infarction, right ventricular infarction, pericardial inflammation, acute hypoxia, ionic disturbances such as hypokalemia, hemodynamic impairment secondary to LV dysfunction, and circulating catecholamines (endogenous or exogenous).[6–8] The result is a vicious circle composed of AF, myocardial ischemia and heart failure, in which each element aggravates the other two. In the early period of ACS, several factors have been associated with the occurrence of AF, such as advanced age, heart failure, LV dysfunction, mitral regurgitation, excessive sympathetic/parasympathetic nerve stimulation, pericardi-