

Atrial fibrillation in COVID-19 patients admitted to an intensive care unit: prevalence and prognosis

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Background: The association between atrial fibrillation (AF) and prognosis has been studied in non-COVID-19 patients, but few studies reflect the reality of critically ill COVID-19 patients admitted to a general intensive care unit (ICU).

Purpose: This study sought to investigate the relationship between previous and new-onset AF in COVID-19 patients admitted to an ICU and prognosis.

Methods: We retrospectively analyzed patients consecutively admitted to an ICU with COVID-19 and followed them for a median period of 7 months. Patients admitted due to trauma or emergent surgery were excluded from the analysis. Three groups were identified: without AF (G1), with prior history of AF (G2), and with new-onset AF (G3). Groups were compared, with special interest regarding ICU mortality, duration of mechanical ventilation, length of hospitalization, major adverse cardiac events (MACE), and re-hospitalization. MACE was defined as all-cause ICU mortality, new-onset heart failure, acute coronary syndrome, ventricular arrhythmias, pulmonary embolism, myocarditis, and stroke (ischemic or hemorrhagic).

Results: A total of 297 patients was included in the analysis: without AF (248 patients, 83.5%), with prior history of AF (15 patients, 5.1%), and with new-onset AF (34 patients, 11.4%). Median age was 62 (IQR 17) years, and most patients were male (198 patients, 66.7%).

Patients with a prior history of AF were older [median (IQR), G1 60 (16),

G2 71 (12), G3 67 (15) years, $p=0.001$], were more likely to have a history of coronary artery disease (G1 4.9%, G2 26.7%, G3 11.8%, $p=0.002$), and history of heart failure (G1 6.5%, G2 33.3%, G3 17.6%, $p<0.001$). Patients with new-onset AF had a longer duration of mechanical ventilation [median (IQR), G1 9 (13), G2 11 (16), G3 18 (12) days, $p<0.001$], longer ICU length of stay [median (IQR), G1 12 (10), G2 13 (12), G3 19 (15), $p=0.001$], higher ICU mortality rate (G1 27.0%, G2 33.3%, G3 58.8%, $p=0.001$), and higher rate of MACE (G1 31.9%, G2 33.3%, G3 70.6%, $p<0.001$), compared to the other groups. There were no differences regarding sex distribution, other baseline comorbidities, need for invasive mechanical ventilation, vasopressor use, and re-hospitalization rates among groups. Most AF patients were treated with beta-blockers (39.6%) and amiodarone (77.1%), but only 68.8% of patients received anticoagulation (G2 92.9%, G3 58.8%), which may reflect that physicians underestimate the prognosis of new-onset AF.

In multivariate analysis, new-onset AF (OR 3.07, 95% CI 1.42–6.67, $p=0.005$) and older age (OR 1.07, 95% CI 1.04–1.09, $p<0.001$) remained independent predictors of ICU mortality. Main results are presented in Table 1. Kaplan-Meier survival curves are presented in Figure 1.

Conclusion(s): This study shows that critically ill COVID-19 patients with AF present a worse prognosis compared to patients without AF, and new-onset AF is an independent predictor of ICU mortality and MACE.

	Without AF (n=248, 83.5%)	Prior AF (n=15, 5.1%)	New-onset AF (n=34, 11.4%)	p-value
Age in years, median (IQR)	60 (16)	71 (12)	67 (15)	0.001
Male gender, %	65.3	80.0	70.6	0.441
ICU length of stay in days, median (IQR)	12 (10)	13 (12)	19 (15)	0.001
Mechanical ventilation in days, median (IQR)	9 (13)	11 (16)	18 (12)	<0.001
ICU mortality, %	27.0	33.3	58.8	0.001
MACE, %	31.9	33.3	70.6	<0.001
Re-hospitalization, %	4.4	13.3	5.9	0.303

Table 1. Main results

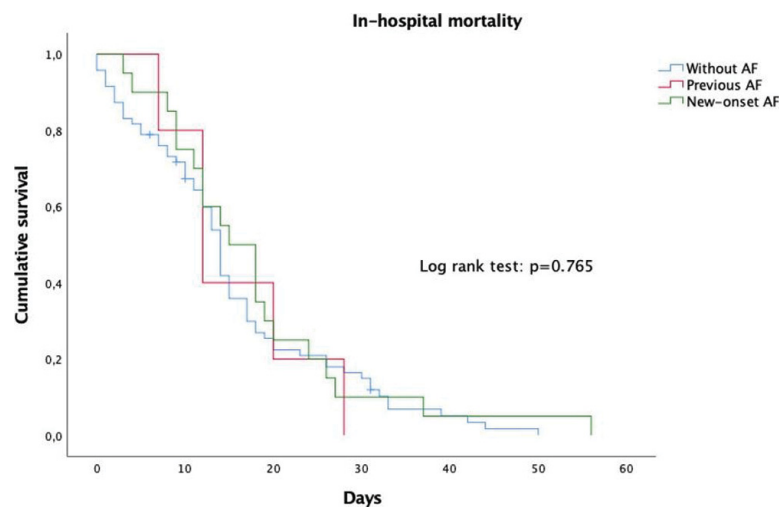


Figure 1