Contribution of Atrial Fibrillation to In-Hospital Mortality in Patients With COVID-19

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Atrial fibrillation (AF) shares with coronavirus infec-tive disease-19 (COVID-19) a higher prevalence of older age, cardiovascular risk factors, and comorbid-ities.1–3 Among patients with COVID-19, a history of AF is reported in ≈20% of cases,4 and new-onset AF repre-sents a common complication, especially in those with a more severe disease.1–3 We specifically investigated the prognostic role of AF on in-hospital outcome in consecu-tive patients admitted for COVID-19 in 3 Italian Institu-tions (Hospitals of Novara, Vercelli, and Chieti).

We retrospectively included consecutive patients aged ≥18 years hospitalized for COVID-19 from Febru-ary to May 2020. The study protocol was approved by the institutional ethical committee (Institutional Review Board code CE 97/20), and patients gave informed con-cent to participate. All patients received a 12-lead ECG on admission. Additional electrocardiograms were per-formed every 48 hours in patients receiving QT-interval prolonging drugs (>90% of the whole population) or when clinically indicated. Patients were divided according to presence (either historical or new-onset) or absence of AF during the hospitalization for COVID-19. Historical AF was defined as a past medical history of AF.

Primary end point was in-hospital all-cause mortality in patients with versus those without AF and in patients with different AF subtypes (historical and new-onset) ver-sus those without AF. The following end points were also evaluated during in-hospital stay: cardiovascular mortality and severe acute respiratory distress syndrome. Logistic regression models were used to estimate the inde-pendent association between AF and study end points, including demographic factors, comorbidities, laboratory findings, and in-hospital treatments.

A total of 637 patients were enrolled; 503 (79%) patients had no AF, and 134 (21%) had in-hospital AF (historical in 79 patients and new-onset in 55). Com pared with patients without AF, those with AF were older and presented a higher prevalence of female sex, arterial hypertension, diabetes, cardiomyopathy, peripheral artery disease, chronic kidney disease, and chronic obstructive pulmonary disease. White blood cell count and C-reactive protein were increased and PaO2/FiO2 was reduced in the subset with new-onset versus historical AF.

In-hospital mortality was higher in patients with AF (44.4% versus 22.1% in those without, \( P=0.001 \)); 30-day estimated survival rates by Kaplan-Meier method were 39.6% (95% CI, 27.8%–50.8%) versus 59.4% (51.4%–66.5%), respectively (log-rank \( P<0.001 \); Figure [A]). The incidence of cardiovascular death and severe acute respiratory distress syndrome during the hospital-ization was also increased in the AF group (10.3% versus 5.2%, \( P=0.039 \); 37.8% versus 24.5%, \( P=0.042 \); respec-tively). At logistic regression analysis, AF (historical and new-onset) was significantly associated with higher risk of all-cause death (odds ratio [OR], 2.44 [95% CI, 1.18–5.07]; \( P=0.016 \); other independent predictors of
that new-onset AF is related to the degree of inflammation and oxidative stress of COVID-19 patients, with consequent worsening in prognosis. The authors will make the data, methods used in the analysis, and materials used to conduct the research available to any researcher for purposes of reproducing the results.

**ARTICLE INFORMATION**

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Figure. Kaplan-Meier curves at 30 days. Estimates of survival stratified by presence/absence of atrial fibrillation (AF; A) and by AF subtypes (B) are illustrated.