

RESEARCH LETTER

Increase in atrial fibrillation–related mortality in the United States during the COVID-19 pandemic

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The coronavirus disease 2019 (COVID-19) pandemic has caused more deaths due to both COVID-19 and other clinical conditions such as cardiovascular disease. The relationship between atrial fibrillation (AF) and COVID-19 infection is complex.¹ Indeed, AF has found to be associated with a significantly increased risk of short-term mortality in patients infected with severe acute respiratory syndrome coronavirus 2.² Furthermore, patients with COVID-19 per se have an increased risk of developing AF.³ The aim of the present study was to investigate the trend of AF-related mortality in the United States before and during the COVID-19 pandemic. For this purpose, de-identified mortality data on the multiple causes of death between 2015 and 2020 provided by the Centers for Disease Control and Prevention through the free platform CDC WONDER were used.⁴ *International Classification of Diseases, Tenth Revision* codes related to AF (I48.x) or COVID-19 (U07.1), listed in any position of death certificates, were used to identify patients suitable for the analysis. AF-related age-adjusted mortality rates (with corresponding 95% confidence intervals [CIs]) and relative trends (calculated as average annual percent change) were determined using Joinpoint regression (Joinpoint, version 4.6.0.0, National Cancer Institute, Bethesda, Maryland) to analyze changes in trends, if any, over the years. Subgroup analysis based on sex, age >65 years, and race were also performed. Because data were publicly available and de-identified, no ethic approval was required for the present study.

During 2020, 263,431 deaths due to AF were registered in the United States. Of these, 217,279 and 46,152 were recorded in subjects without and with COVID-19 infection, respectively. In that year, the overall AF-related age-adjusted mortality rate was 52.2 (95% CI 52.0–52.4) and 11.1 (95% CI

11.0–11.2) per 100,000 population in individuals with and without COVID-19 infection, respectively. Proportionate mortality of AF patients with COVID-19 was 17.5%. During the pandemic, the age-adjusted mortality rate was significantly higher, as per Joinpoint regression (average annual percent change 5.1; 95% CI 3.3–7.0; $P < .0001$), than that observed during 2019 (44.8 per 100,000; 95% CI 44.6–45.0) and 2018 (43.7 per 100,000; 95% CI 43.5–43.9), resulting in an increase of 43.3% and 50.2%, respectively. Moreover, the AF-related age-adjusted mortality rate was higher in men during the study period (Figure 1). Regarding the AF-related deaths in patients with COVID-19 during 2020, the age-adjusted mortality rates were higher in men than in women (14.7; 95% CI 14.5–14.9 per 100,000 vs 8.5; 95% CI 8.4–8.6 per 100,000), in whites than in blacks (11.4; 95% CI 11.3–11.5 per 100,000 vs 11.1; 95% CI 10.7–11.4 per 100 000), and in subjects older than 65 years (14.5; 95% CI 14.4–14.7 per 100,000 vs 7.3; 95% CI 7.1–7.5 per 100,000). AF-related deaths were observed in 93.4% of patients older than 65 years.

During the first year of COVID-19 pandemic, an excess mortality related to AF was observed in the United States. As evidenced by our subanalyses, this phenomenon mainly affected white men older than 65 years while the difference between whites and Black was not so obvious as demonstrated by the overlap of the CIs. Indeed, blacks were less frequently hospitalized for COVID-19; this phenomenon contributes to the underestimation of AF.⁵ Notably, a swift increase in AF-related mortality was observed during the entire study period but this trend did not reach the statistical significance until the COVID-19 outbreak. Probably, all the provided data may have underestimated the real impact of AF in 2020, especially during the early phase of the pandemic, for the presence of undiagnosed cases and for potential miscoding because our analysis is based on death certificates. Moreover, the rates of underlying comorbidities, sex ratios, and age distribution may be different from those present in other parts of the world, limiting the generalizability of our findings. Finally, no data were available on the AF-related mortality in patients with long COVID. The present findings reinforce the need for additional screening and public health care interventions to identify AF in the general

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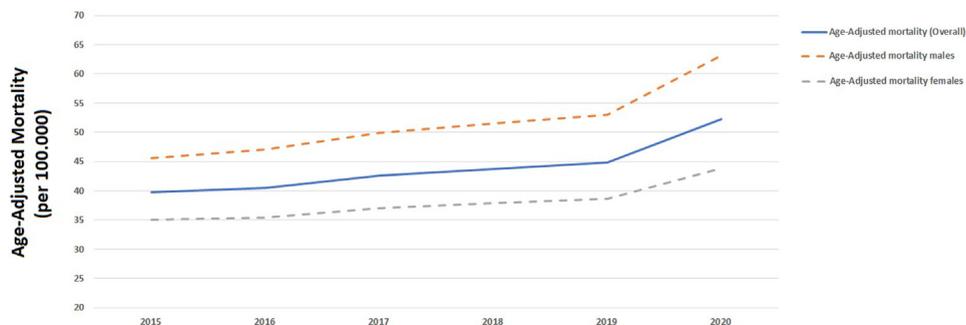


Figure 1 Atrial fibrillation–related age-adjusted mortality in the United States between 2015 and 2020 (first year of the coronavirus disease 2019 pandemic).

population remembering the prognostic impact of this arrhythmia in patients with COVID-19.

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