

Atrial Fibrillation and Supraventricular Tachycardia Are Predictors of Inpatient Mortality in Mechanically Ventilated Patients in the United States

Authors: Moiz Ehtesham, MD¹; Maria Riasat, MD²; Muhammad Asim Shabbir, MD³

¹ Albany medical college, Albany, NY

² Mount Sinai Beth Israel, Manhattan, NY

³ University of Nebraska Medical Center, Omaha, NE

Abstract:

Background: Arrhythmias are a significant clinical challenge and can complicate hospital course for mechanically ventilated patients. We aimed to determine the burden of arrhythmias and their effect on inpatient outcomes in mechanically ventilated patients in the US.

Methods: The national inpatient sample was retrospectively studied (2015-2019) to identify all mechanically ventilated patients aged > 17. We further identified the following arrhythmias within each admission: atrial fibrillation (AF), non-sustained ventricular tachycardia (NSVT), supra-ventricular tachycardia (SVT), atrioventricular block (AVB) and ventricular fibrillation (VF). Primary outcomes were inpatient mortality rate, hospital length of stay (LOS) and total cost for each type of arrhythmia. Demographic (age, sex, race) and clinical information (history of hypertension, stroke, myocardial infarction, obesity) was recorded. Data was studied in STATA 15 and multivariate logistic regression was used to estimate adjusted odds ratios (AOR) reported with p-value (significance= <0.05).

Results: Our analysis included 1,745,867 weighted discharges of mechanically ventilated patients. Mean age was 65 years (56% male, 69% Caucasian). Most frequent arrhythmia was AF (63% of all patients) and least common was AVB (11%). AF, VF, and SVT were associated with an increase in mortality (AOR: 3.52, 2.78, 1.45 respectively, $p < 0.001$). NSVT, AF, and SVT were associated with an increase in hospital LOS of 4.5, 3.2, and 2.8 days respectively (AOR 3.31, 2.94, 1.75 respectively, $p < 0.001$). The adjusted inpatient cost was highest in patients with NSVT (\$21,567, $p < 0.05$). AVB and NSVT were not associated with an increase in mortality ($p < 0.05$). On gender and race stratification, African American males had the highest mortality rate secondary to AF and VF (AOR: 3.54 and 4.21 respectively, $p < 0.001$).

Conclusion: We demonstrate that atrial fibrillation, ventricular fibrillation, and SVT are independently associated with increased mortality in mechanically ventilated patients. We also show that NSVT is associated with increase in hospital LOS in these patients. African American mechanically ventilated males had the highest mortality rates secondary to atrial and ventricular fibrillation.