

PEDIATRIC PATIENTS ADMITTED WITH IMPLANTABLE CARDIOVERTER DEFIBRILLATOR AT INCREASED RISK OF INPATIENT DEATH

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Background: Utilization of implantable cardioverter-defibrillators (ICD) in children has increased over time. While prior studies have evaluated complications associated with ICD implantation, there is no data regarding incidence of mortality or risk factors associated with death among patients with ICDs. We hypothesized that inpatient death was more likely to occur among patients with cardiomyopathy or heart failure rather than arrhythmia diagnosis alone.

Materials/Methods: The Kid Inpatient Database (KID) was used to identify all children <21 years of age hospitalized with an existing ICD between 2000 through 2016. Patients with new ICD implants were excluded. Data included demographic data of each admission, hospital characteristics, and outcome (inpatient death vs. discharge) were collected. Diagnostic ICD9 and ICD10 codes for cardiomyopathy, primary arrhythmia, and heart failure were evaluated. Patients with ICD and inpatient death were compared to patients with ICD who were discharged. Statistical analysis was performed using SAS. Fischer's exact test and Wilcoxon rank sum was used for categorical continuous variables respectively. Multivariable analysis was performed using Logistic regression. A Bonferroni correction ($p < 0.01$) was applied to account for multiple comparisons.

Results: A total of 18,377,970 pediatric hospital admissions were identified from KID 2000 through 2016. A total of 2656 admits with ICDs present were included; 2160 new ICD placements were excluded. Of the admits with ICDs present, 38 (1.4%) died while 2618 (98.6%) were discharged. When comparing pts that died to those discharged (median age 18 years, IQR 15-19 vs 17 years., IQR 14-19), on univariate analysis pts who died were more likely to be older ($p < 0.0001$), have a longer length of stay ($p < 0.001$), have a diagnosis of cardiomyopathy (OR 2.8, 95% CI 1.4-5.7), and have both heart failure and arrhythmia diagnosis (OR 7.1, 95% CI 3.7– 13.5) but the difference in arrhythmia was not statistically significant when corrected. On multivariable analysis, the only statistically significant associated factor was presence of both heart failure and arrhythmia (OR 6.7, 95% CI 2.4 -18.6).

Conclusions: The mortality rate among pediatric patients admitted with an ICD present is low (1.4%). Diagnosis of heart failure and arrhythmia are significantly associated with mortality in this group.