Trends, Predictors and Outcomes of Ischemic Stroke in Patients With a Left Ventricular Assist Device

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BACKGROUND
Patients with a left ventricular assist device (LVAD) are at increased risk of ischemic stroke (IS). Risk factors and outcomes of IS among LVAD patients are not fully defined.

OBJECTIVE
Trends, predictors and outcomes of IS in LVAD patients.

METHODS
Nationwide Inpatient Sample (NIS) database between 2007 and 2011 was used to identify patients with LVAD discharged with and without a diagnosis of IS. Trends, predictors and outcomes of IS were analyzed using a multivariate regression model.

RESULTS
A total of 17,323 discharges for LVAD were found and 624 (3.6%) patients had a co-diagnosis of IS. Between 2007 and 2011, the number of discharges with LVADs increased from 946 to 5,540 while the proportion of patients with IS remained stable at 3.4% (Figure 1). After adjustment for potential confounders, increasing Charlson co-morbidity index score was an independent predictor of IS (Figure 2). In-hospital mortality was four-fold higher in the IS group (odds ratio: 4.1; P<0.0001). Renal disease (OR: 4.2, P=0.01), liver disease (OR: 5.3, P=0.01) and coagulation disorder (OR: 5.3, P=0.03) were also independent predictors of mortality in LVAD patients with IS.

CONCLUSIONS
Increasing comorbidity burden significantly increases the risk of IS and mortality among patients with IS and LVAD is 4-fold higher. Renal, liver and coagulation disorders are independent predictors of mortality in LVAD patients with IS. Targeting susceptible patients based on modifiable elements of the Charlson comorbidity index may reduce risk of IS among LVAD patients.

Figure 1: Yearly Trend in Admission with Patients with LVAD and IS in LVAD

Figure 2. Incidence of Ischemic Stroke by Charlson Comorbidity Index