Intensive care unit readmission following left ventricular assist device implantation: causes, associated factors, and association with patient mortality

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Introduction:
Previous studies on readmission following LVAD implantation have focused on hospital readmission after dismissal from the index hospitalization. Since there are very little data existing, the purpose of this study was to examine intensive care unit (ICU) readmission in patients during their initial hospitalization for LVAD implantation to determine reasons for, factors associated with, and mortality following ICU readmission.

Methods:
This was a retrospective, single center, cohort study in an academic tertiary referral center. All patients at our institution undergoing first time LVAD implantation from February 2007 to March 2015 were included. Patients dismissed from the ICU who then required ICU readmission prior to hospital dismissal were compared to those not requiring ICU readmission prior to hospital dismissal.

Results:
Among 266 LVAD patients, 45 (16.9%) required ICU readmission. The most common reasons for admission were bleeding and respiratory failure. Factors found to be significantly associated with ICU readmission were preoperative hemoglobin level of less than 10 g/dL, preoperative estimated glomerular filtration rate <35mL/min/1.73m2, preoperative atrial fibrillation, preoperative dialysis, longer cardiopulmonary bypass times, and higher intraoperative allogeneic blood transfusion requirements. Mortality at 1 year was 30.2% in patients requiring ICU readmission vs. 11.9% in those not requiring ICU readmission (age-adjusted OR=3.0, 95% CI 1.4 to 6.6, p=0.005).

Conclusion:
ICU readmission following LVAD implantation occurred relatively frequently and was associated with significant one-year mortality. These data can be used to identify LVAD patients at risk for ICU readmission and implement practice changes to mitigate ICU readmission. Future larger and prospective studies are warranted.

References:
Reasons for ICU readmission during index hospitalization after LVAD placement. Of the 18 patients requiring ICU readmission for bleeding, 8 involved chest bleeding (e.g., hemothorax, cardiac tamponade), 7 gastrointestinal bleeding, 1 retroperitoneal bleeding, 1 bilateral subdural hemorrhage, and 1 tracheostomy site bleeding. Other reasons for ICU readmission included non-hemorrhagic cerebrovascular accident (2), LVAD malfunction (2), hyperactive psychosis (1), hyperkalemia (1), right ventricular failure (1), renal failure (1), syncope (1), and acute arterial thrombosis (1).