Safety of Anticoagulation Reversal in Patients Supported With Continuous-Flow Left-Ventricular Assist Devices

D.L. Jennings,1 M. Jacob,2 A. Chopra,2 C.W. Nemerovski,3 J.A. Morgan,4 D.E. Lanfear.5

Purpose: The purpose of this study is to characterize the potential thromboembolic risk associated with reversal of warfarin-based anticoagulation in patients with continuous-flow left-ventricular assist devices.

Methods: All patients implanted with a CF-LVAD between January 1, 2008 and August 1, 2012 at our institution were screened for inclusion. Patients who were confirmed to have received anticoagulation reversal during an inpatient admission were enrolled. Data collection included patient demographics, indication for reversal, location of hemorrhage, type of procedure, as well as the type and dose of the anticoagulation reversal agent. The primary outcome was the incidence of thrombotic events, including stroke, device thrombosis, or venous thromboembolism within 30 days of anticoagulation reversal. Additional laboratory monitoring as well as 30 day mortality were also analyzed. Patient demographics and clinical endpoints were characterized with descriptive statistics.

Results: Of the 122 patients screened, 25 patients (mean age 53 years, 84% male, 72% non-ischemic, 80% HeartMate II, 56% bridge-to-transplant) experienced 38 anticoagulation reversal events. The indications for reversal were overt (19) or suspected (3) hemorrhage, invasive procedure (7), or a supra-therapeutic INR value (9). All patients received vitamin K at a mean dose of 10±8 mg, while 60 percent of patients received fresh frozen plasma (mean 4.4 ± 3 units). Only two patients received prothrombin complex concentrate and three patients received activated Factor VII. The mean INR decreased from 4.1±4.2 to 1.7±0.8 after reversal in the overall population. The rate of thromboembolism within 30 days of attempted reversal was 2.6% (1/38). This patient developed an ischemic stroke 15 days after reversal with a high dose of activated Factor VII for an acute intracranial bleed. He was not anticoagulated at the time of his ischemic event. The mortality rate within 30 days of reversal was 20% (5/25), with three of these deaths resulting from acute intracranial hemorrhage. All survivors were restarted on warfarin and aspirin upon hospital discharge. Only 6 patients were bridged using parenteral anticoagulants after the reversal episode (heparin = 4, enoxaparin = 2).

Conclusion: The risk of thrombosis after anticoagulation reversal in our cohort of CF-LVAD patients was acceptably low.

Anticoagulation for the HeartWare HVAD: An International Comparison of Strategies and Outcomes

D.L. Jennings,1 R.M. Gellatly,2 E.G. Szandzik,3 A. Leet,4 D.E. Lanfear.5

Purpose: The intent of this project is to characterize anticoagulation management strategies and compare clinical outcomes between two international centers.

Methods: His retrospective cohort included patients implanted with the HeartWare HVAD from 07/01/2009 through 06/12/2012 at site 1 (United States) and from 01/11/2011 through 04/13/2013 at site 2 (Australia). Patients at site 1 were managed at a specialized anticoagulation clinic run by physicians and nurses. All patients received aspirin 325 mg daily, had a target INR of 2-3, and were bridged with enoxaparin during periods of sub-therapeutic anticoagulation. At site 2, patients were dosed by their local pathology service. Patients received aspirin 100 mg daily, dipyridamole 100 mg 2-3 times daily, had a target INR of 2-3, and were bridged with enoxaparin.

Abstracts