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Jeremy Moretz
Soumen Das
Craig Beavers
Doug Jennings
Jenna F. Cox

See next page for additional authors

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Authors
Jeremy Moretz, Soumen Das, Craig Beavers, Doug Jennings, Jenna F. Cox, Robert DiDomenico, Steve Dunn, Long To, Toby Trujillo, Phillip Weeks, and Scott Corbett
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Jeremy Moretz, PharmD1, Soumen Das, PhD2, Craig Beavers, PharmD2, Doug Jennings, PharmD3, Jenna F. Cox, PharmD4, Robert DiDomenico, PharmD5, Steve Dunn, PharmD1, Long To, PharmD1, Toby Trujillo, PharmD1, Phillip Weeks, PharmD1, Scott Corbett, PhD5; 1Abiomed, Danvers, MA, USA, 2University of Kentucky College of Pharmacy, Lexington, KY, USA, 3Long Island University College of Pharmacy, Brooklyn, NY, USA, 4Prisma Health Richland Hospital, Columbia, SC, USA, 5UIC College of Pharmacy, Chicago, IL, USA, 6University of Virginia Health System, Charlottesville, VA, USA, 7Henry Ford Health System, Detroit, MI, USA, 8University of Colorado Skaggs School of Pharmacy, Aurora, CO, USA, 9Memorial Hermann Texas Medical Center, Houston, TX, USA

Study: The Impella catheter is a transvalvular, micro-axial left ventricular assist device that provides temporary mechanical circulatory support and requires a heparin-containing purge solution to reduce the risk of biomaterial deposition in the purge gaps and also maintain proper pump function. For patients with suspected or confirmed heparin-induced thrombocytopenia (HIT), direct thrombin inhibitors (DTI) have been proposed as an alternative to heparin in the purge, but have been associated with pump failure requiring temporary TPA in the purge solution to normalize pump function. In this report, we review HIT patients supported with a sodium bicarbonate-based purge solution (BBPS).

Methods: Patients with suspected or confirmed HIT on Impella support using sodium bicarbonate (25 mEq in 1L D5W solution) in the purge from September 2020 to January 2021 were reviewed. Case data were obtained from Impella Quality (IQ) database for those supported with a BBPS and clinically suspected or confirmed HIT. Purge pressures and purge flows were evaluated from the Automated Impella Controller (AIC).

Results: Ten patients were supported with a BBPS during this period. Impella support was begun either with no anticoagulant (n=5), DTI (n=2), or heparin (n=3) and then switched to BBPS. Impella run time using a BBPS ranged from 1-14 days; five pumps had a run time with a BBPS > 10 days (Figure 1). Systemic DTI use was used in five cases along with a BBPS. No purge pathway thrombosis or bleeding events were observed, along with no changes in purge flow or purge pressures observed. In conclusion, preliminary experience suggests the use of BBPS in the setting suspected or confirmed HIT patients supported with an Impella is safe and effective and may provide a useful therapeutic option for heparin intolerant patients. Future work should investigate mechanisms and purge reliability of BBPS in this setting.

Figure 1: (A) Clinical indication, and (B) Duration of use across different Impella purge types supported with bicarbonate in the purge.