Reducing GI bleeds in VAD Patients after Initiating Home Remote Monitoring

By: Monica Smith, BSN, RN

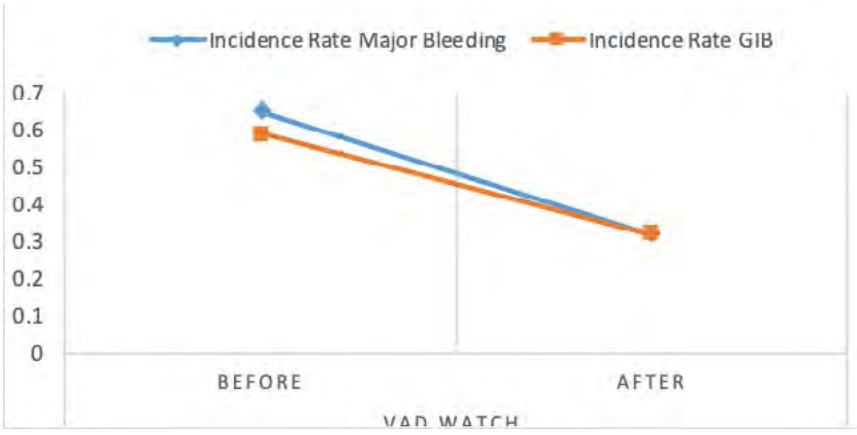
Ventricular assist devices (VAD) are implanted mechanical circulatory support devices used for those patients who have weakened hearts or heart failure, often used as a bridge to support a patient while waiting for heart transplant. VAD patients have an increased risk of bleeding due to the low pulsatile flow and high sheer stress caused by the impeller speed of the VAD itself. They also require anticoagulation and antiplatelet therapy post implant which further increases their risk of bleeding, or, if sub-therapeutic, puts them at an increased risk for thrombosis of their VAD. Once discharged, VAD patients are required to have labs drawn to assess international normalized ratio (INR) a minimum of once a week to ensure the patient's drug levels are at a therapeutic range.

Prior to our project's initiation, VAD patients would have to travel to a lab to get a venipuncture every week to monitor their INR. Because many of the patients go to laboratories outside the UCSD system (LabCorp, Quest), it may take a few days to obtain results. This process can cause a delay in treatment and anticoagulation dose adjustment. The majority of our patients have limited resources; therefore, frequent trips to labs may pose additional hardships on the patient and their family. In addition to their weekly lab visits, VAD patients also visit the clinic as often as every week to every month to review and assess vital signs, VAD numbers and lab results.

The objective of this project was to enroll each VAD patient into the VADWatch program in order to achieve daily remote monitoring of VAD numbers, vital signs and obtain weekly INRs via point of care (POC) finger stick machines.

With more frequent and real time monitoring, we hoped to reduce the occurrence of gastrointestinal bleeding (GIB) rates in VAD patients as compared to the GI bleeding rates prior to VADWatch initiation. Decreasing the incidence of GIB would reduce the rate of readmission and decrease the use of blood products. Reducing the use of blood products is especially important in the VAD patient population as many of them are listed for heart transplantation. Minimizing patient exposure to blood products reduces the risk of human leukocyte antigen (HLA) sensitization, which can further limit their potential donor pool.

To help improve patient outcomes, UCSD partnered with University of California



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is a Clinical Nurse III, VAD coordinator, for the Heart Transplant and VAD program at UC San Diego Health. She started her nursing career as a cardiac ICU nurse in Virginia and quickly fell in love with the heart transplant population. She was recruited by several of the advanced heart failure cardiologists to become a VAD coordinator for their program. With a broadened career as a coordinator, she sought out other VAD coordinator positions throughout the country and landed at UC San Diego over 3 years ago.

Figure 1: HeartMate III. Adapted from HeartWare, 2012, retrieved from https://www.heartware.com/clinicians/instructions-use.

San Francisco (UCSF) for recommendations on remote monitoring. In a recent study published by UCSF in 2016, they found a 20% reduction in risk of GIB after initiation of VADwatch (Svetlichnaya, et al., 2016).

Before patients are discharged from the hospital, a prescription for Acelis remote monitor is signed with a patient agreement. In the VADWatch program, patients are supplied with an IPad, scale, BP cuff or Doppler and a POC INR machine. Each patient has specific parameters and ranges set based on their baseline. Patients are then expected to log onto VADWatch daily and record their VAD readings, weight, BP, pulse and temperature. They will also obtain a finger stick INR at home weekly or as ordered, then upload the lab value into VADWatch. The VAD coordinators review all entries in VADWatch throughout the workday and discuss any out-of-range entries with a physician. Daily trending of these numbers can give us an early warning of potential adverse events so we can act early and avoid hospital admission.

Data was collected between January 2015 and October 2017. VADWatch was implemented in 50 patients after a median of 113 days post-implant. Prior to VADWatch, the incidence rate of major bleeding and GIB were 0.65 and 0.59 events per patient year, respectively. After the implementation of VADWatch, major bleeding and GIB incidence rates were reduced by roughly 50% (0.38 and 0.32 events per patient year).

With the increased monitoring and communication with each VAD patient we could further evaluate our data and expect to see a decreased admission rate for GIB due to early intervention and treatment.

In conclusion, among our study VADWatch population, 38% of patients experienced at least one episode of major bleeding, one-third of which were GI bleeds, down from 65% of all VAD patients prior to VADWatch. These results demonstrate a significant decrease in GIB amongst VAD patients after implementation of VADWatch. Based upon these positive findings, the VAD team has decided to continue to enroll patients into VADWatch with the aim of reducing VAD complications.

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Figure 2. HeartWare. Adapted from HeartWare, 2011, retrieved from http://www.thoratec.com/medical-professionals/resource-library/ifus-manuals/heartmate-II-lvad.aspx#.