Institution of a Patient Blood Management Program to Decrease Blood Transfusions in Elective Knee and Hip Arthroplasty

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Background/Introduction: Major orthopedic surgery is associated with an anticipated level of high blood volume loss.[1,2] Pre-operative anemia is an independent prognostic factor of increased mortality and morbidity following orthopedic surgery.[1,3] It has been shown that approximately 40% of patients evaluated prior to elective orthopedic surgeries are anemic (women Hb <12g/dl, men Hb < 13g/dl).[1] Pre-operative anemia is a major predictor of allogeneic blood transfusion (ABT).[2,3] ABT during the perioperative period is known to be associated with increased rate of infections, transfusion reactions, perioperative mortality and increased length of stay.[1,2,3]. Our effort aimed at reducing the incidence of blood transfusions during elective joint arthroplasty.

We instituted a Patient blood management (PBM) program as a component of our Perioperative Surgical Home with the goal of improving patient outcomes and reducing the incidence of perioperative anemia in joint arthroplasty patients. The goals of our PBM program are to (1) Identify and treat pre-operative anemia, (2) Reduce autologous blood transfusions, (3) Reduce blood loss during surgery, (4) Reduce allogeneic blood transfusions, (5) Increase tolerance to anemia and adaptation of transfusion triggers.

Methods: Preoperative, intraoperative and postoperative PBM protocols were implemented for all patients undergoing elective knee and hip arthroplasty. Preoperatively, patients were seen approximately 30 days prior to surgery for clinical evaluation and assessment, which comprised of screening for bleeding and coagulation risk as well as anemia. Patients were treated with one or more of the following: IV iron, vitamin supplementation or erythropoietin stimulating agents. Autologous blood donation was eliminated. Intraoperatively, the use of cell savage, hemostatic agents and antifibrinolytics was instituted. Post operatively, post-surgical anemia was assessed and treated with IV iron. Blood products ordered for joint arthroplasty patients required approval from anesthesia prior to transfusion. Transfusion triggers dropped to 7g/dl in non-cardiac patients and at 8g/dl in cardiac patients.

Results: Since implementing the PBM program, blood utilization has decreased drastically. There has also been a corresponding reduction in length of stay. At the initiation of the program in 2013, the rate of transfusion in total knee arthroplasty was 16.50%. There has since been a significant decrease to 8.22% in 2014 and 2.87% in 2015. In total hip arthroplasty, the average rate of transfusion was 24.44% in 2013, with a decrease to 13.03% in 2014 and 10.64% in 2015. In 2013, the average length of stay was 3.20 and 3.48 for total knee and hip arthroplasty patients with a drop to 2.86 and 3.05 respectively in 2015.

Conclusion: Implementation of a patient blood management program is an effective way to treat preoperative anemia, reduce allogeneic blood transfusions and improve patient outcomes and risk, while reducing length of stay and reducing cost.

References:

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