

Predictors and Complications of Blood Transfusion in Total Hip and Knee Arthroplasty

Nolan M. Wessell, MD, Michael A. Charters, MD, MSE, Jakub A. Sikora-Klak,
Stephen Yu, Christopher R. Dobson, James J. Jeffries, Craig D. Silverton, DO,
Michael W. Laker, MD, **Nicholas B. Frisch, MD, MBA**

Introduction: Increased attention has been paid toward perioperative optimization to minimize the need for post-operative blood transfusions in patients undergoing total hip arthroplasty (THA) and total knee arthroplasty (TKA). The purpose of this study was to determine pre-operative, operative and post-operative predictors of transfusion and identify complications associated with transfusions.

Methods: A retrospective chart review of clinical records from 1795 patients who underwent total hip arthroplasty (THA) or total knee arthroplasty (TKA) at our institution between January 1, 2011 and December 31, 2012. After excluding patients if they had a bilateral procedure, partial arthroplasty or revision surgery, a total of 1573 patients were ultimately included. Logistic regression evaluated variables predictive of transfusion and a stepwise logistic model determined the best fit multivariate model. A Wilcoxon two-sample test, a Spearman's correlation and a linear regression to analyze the number of units transfused.

Results: Of the 1573 patients included in the study 949 patients underwent TKA and 624 patients THA. 88 (9.27%) TKA patients received a blood transfusion compared to 166 (26.6%) THA patients. Significant predictors for transfusion are: hemoglobin OR 0.62 [95%CI, 0.53, 0.76, $p=0.001$], age 1.45 [1.19, 1.77, $p=0.001$], female gender 2.60 [1.55, 4.43, $p=0.001$], body mass index 0.84 [0.72, 0.98, $p=0.027$], creatinine 1.35 [1.05, 1.74, $p=0.020$], TKA 0.39 [0.25, 0.63, $p=0.001$], operating room time 1.25 [1.05, 1.74, $p=0.029$], estimated blood loss 1.14 [1.06, 1.24, $p=0.001$], intra-operative fluids 1.04 [1.01, 1.07, $p=0.012$]. DVT rate was 1.9% and not statistically significant, but infection rate amongst transfused patients was 13.3% higher than non-transfused patients ($p=0.001$).

Conclusion: The rates of blood transfusion at our institution were 9.27% in TKA and 26.6% in THA. Increased age, female gender and BMI were predictive of transfusions. Rates of transfusion increased with longer OR time, EBL and IVF. DVT rates were similar regardless of transfusion, but infection rates were statistically higher in the transfused patients.

