

Preoperative Anemia is an Independent Risk Factor for Increased Complications and Mortality After Total Knee Arthroplasty Regardless of Postoperative Transfusions

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INTRODUCTION:

Preoperative anemia is a known risk-factor for complications and prolonged length of stay (LOS) following total knee arthroplasty (TKA). This association, however, has not been well-demonstrated in larger studies. Given the difficulty of studying this topic in a prospective, randomized fashion, we used propensity score matching to isolate the effect of anemia on postoperative complications and mortality following TKA.

METHODS:

A national database was utilized to identify patients from 2010 to 2020 undergoing elective primary TKA. Patients were identified with preoperative anemia (Hb <12g/dL for females, <13g/dL for males) who did not receive postoperative blood transfusion. 1:1 propensity score matching was used to create a matched cohort of patients without preoperative anemia who also did not receive a postoperative blood transfusion. Groups were matched based on the Charlson Comorbidity Index (CCI), American Society of Anesthesiology (ASA) classification, age, sex, and prevalence of bleeding disorders. Outcomes of interest were compared using Chi-squared analysis.

RESULTS:

43,370 patients were included in each of the anemic and non-anemic groups. Mean age was 68 ± 9.9 years, and 56% were female. 1:1 matching was successful, with similar CCI, ASA classification, age, sex, and prevalence of bleeding disorders among groups (all, $p > 0.9$). The incidence of major complications was 4.1% ($n=1,796$) in the anemic cohort versus 2.8% ($n=1,228$) in the non-anemic cohort ($P < 0.001$). The incidence of extended LOS was 8.3% ($n=3,596$) in the anemic cohort versus 6.6% ($n=2,873$) of the non-anemic cohort ($P < 0.001$). The 30-day mortality rate was 0.1% ($n=57$) in the non-anemic cohort versus 0.2% ($n=103$) in the anemic cohort ($p < 0.001$). Patients in the anemic cohort also had increased 30-day rates of wound infection requiring hospital admission, renal failure, reintubation, myocardial infarction, pulmonary embolism, and pneumonia (all, $p < 0.001$).

DISCUSSION AND CONCLUSION:

In matched cohorts of anemic versus non-anemic patients undergoing TKA, all who did not receive postoperative blood transfusions, anemic patients had higher rates of complications, extended LOS and mortality. These findings strengthen the idea that a causal relationship exists between preoperative anemia and postoperative complications, and that optimization of preoperative anemia may reduce the disparity in outcomes between these patient populations.