

Preoperative Anemia Is Associated with Increased Mortality and Complications Following Orthopaedic Trauma Surgery

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Purpose: Our objective was to report the incidence of preoperative anemia in orthopaedic trauma patients and assess its association with postoperative complications and 30-day mortality.

Methods: The American College of Surgeons National Surgical Quality Improvement Program database (2015-2019) was queried for patients who underwent surgical fixation of a hip fracture (HF), lower-extremity fracture excluding the hip (LE), or upper-extremity fracture (UE). Anemia was defined as a preoperative hematocrit <36% for women or <39% for men. χ^2 and multivariate regression that controlled for preoperative variables and comorbidities were used to compare postoperative complications and 30-day mortality.

Results: 159,721 patients met inclusion criteria. The incidence of preoperative anemia was 43.8% overall (HF: 54.8%, LE: 35.3%, UE: 26.0%). Anemic patients had higher rates of any complication (HF: 45.4% vs 19.5%, $P<0.001$; LE: 29.2% vs 6.3%, $P<0.001$, and UE: 11.7% vs 2.3%, $P<0.001$) and 30-day mortality (HF: 6.4% vs 3.8%, $P<0.001$; LE: 2.5% vs 0.5%, $P<0.001$; UE: 1.3% vs 0.2%, $P<0.001$) as well as increased odds of any complication (HF: odds ratio [OR] 2.95 [95% confidence interval (CI) 2.86-3.05], $P<0.001$; LE: OR 3.07 [95% CI 2.83-3.33], $P<0.001$; UE: OR 3.40 [95% CI 2.94-3.93], $P<0.001$) and 30-day mortality (HF: OR 1.35 [95% CI 1.26-1.44], $P<0.001$; LE: OR 1.68 [95% CI 1.28-2.19], $P<0.001$; UE: OR 2.53 [95% CI 1.58-4.04], $P<0.001$).

Conclusion: In this large national database study, preoperative anemia was found to be extremely common in orthopaedic trauma patients, especially those with fractures of the lower extremity. Anemia was associated with increased odds of postoperative complications and 30-day mortality. As anemia is a potentially modifiable risk factor, further research may enable greater preoperative optimization and reduce adverse postoperative events in orthopaedic trauma patients.