The Slow Bleed: Pre-injury Anemia is Associated with Increased Risk of Morbidity and Mortality in Geriatric Hip Fracture Patients

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INTRODUCTION: To assess whether a diagnosis of pre-existing anemia impacts outcomes of geriatric hip fractures

METHODS: 3,789 hip fractures that presented to a single orthopedic department were identified through an IRB approved database. Patients with hemoglobin values recorded between 6 and 12 months preoperatively were included and reviewed for demographic information, initial injury characterizes, surgical characteristics, hospital quality measures, and outcomes. Major complications were defined as sepsis, stroke, pneumonia, myocardial infarction, pulmonary embolus, and respiratory failure. Patients were diagnosed with anemia if their hemoglobin values were less than 12 and 13.5 grams/deciliter for females and males, respectively per the World Health Organization (WHO). Patients were seen for clinical and radiographic follow-up at standard post-operative visits up to 12 months postoperatively. Patients were divided into 2 cohorts: pre-injury anemia versus no pre-injury anemia. Chi square and ANOVA tests were used to compare cohorts. Multivariable regression analysis was used to determine if pre-injury anemia was associated with outcomes found to be different between cohorts while controlling for STTGMA.

RESULTS: 498 patients (13.1%) had hemoglobin values recorded at 6-12 months before their surgery. 273 patients (54.8%) were considered anemic at that time while 225 patients (45.2%) were not. Cohorts were significantly different regarding sex, CCI, pre-injury ambulatory status, and STTGMA score (P < 0.05 for all). Multivariable analysis revealed that pre-injury anemia patients had a higher likelihood of readmission within 30 and 90 days, 1-year mortality, as well as a major complication occurring (P < 0.05 for all).

DISCUSSION AND CONCLUSION: Pre-injury anemia is associated with an increased risk of developing major complications during the index hospitalization as well as mortality and morbidity after discharge. Resources should be directed toward minimizing complications and readmission in this vulnerable patient population.

Multivariable Analysis for Significant Outcomes			
	Odds Ratio	95% Confidence Interval	P-value
30-Day Readmission			
STTGMA	49.31	1.26, 1931.15	0.037*
Pre-injury Anemia	1.77	1.002, 3.13	0.049*
90-Day Readmission		2) fronte to be 1825 (1827 - 1947 - 1947 - 1947 - 1947 - 1947 - 1947 - 1947 - 1947 - 1947 - 1947 - 1947 - 1947	
STTGMA	49.79	1.57, 1583.18	0.027*
Pre-injury Anemia	1.632	1.044, 2.55	0.032*
30-Day Mortality			
STTGMA	2.17	0.002, 2354.68	0.828
Pre-injury Anemia	2.55	0.991, 6.57	0.052
1-Year Mortality			
STTGMA	1.16	0.005, 251.31	0.956
Pre-injury Anemia	3.29	1.64, 6.59	<0.001*
Inpatient Major Complication	ns	9	
STTGMA	5.5	0.091, 332.96	0.416
Pre-injury Anemia	2.59	1.46, 4.58	0.001*
Pre-injury Anemia	2.59	1.46, 4.58	0.00

*STTGMA: Score for Trauma Triage in the Geriatric and Middle-Aged: score covariates are age, GCS, CCI, ambulatory status)