Perioperative Hyperglycemia Is an Independent Risk Factor for Venous Thromboembolism Events After Operative Treatment of Geriatric Femur Fractures

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Purpose: This retrospective cohort analysis aimed to investigate the impact of postoperative glycemic control on outcomes following operative fixation of femoral fractures in adult patients.

Methods: An IRB-approved retrospective cohort analysis was conducted on patients aged ≥60 years undergoing operative fixation for femur fractures (AO/OTA 31, 32, 33) at a single institution between January 2017 and December 2019. Patients, regardless of diabetes mellitus (DM) diagnosis, were divided into 2 groups based on average postoperative blood glucose (≥180 mg/dL or <180 mg/dL) utilizing the first 3 postoperative blood glucoses. Complications, including pulmonary embolism (PE) and venous thromboembolism (VTE) within 90 days, superficial or deep surgical site infection (SSI) at 30 and 90 days, other infections, sepsis, reoperation, nonunion, and 30-day mortality were recorded. A secondary analysis was performed to evaluate those with and without a DM diagnosis. Multivariate logistic regression analysis controlled for demographic confounding variables.

Results: Of the 626 patients (average age 78.6 ± 10.0 years, body mass index [BMI] 27.0 &plus 7.7), 30.7% were male, and 25.0% had a DM diagnosis. Patients with mean postoperative glucose values ≥180 mg/dL were more likely to have a DM diagnosis (87.7% vs 15.6%, P 0.001), were younger (P= 0.019), and had higher BMIs P 0.001), hemoglobin A1C levels (P 0.001), and age-adjusted Charlson Comorbidity Index (P= 0.022) compared to those with mean postoperative glucose values 180 mg/dL. Sex, fracture type, and American Society of Anesthesiologists score did not differ between groups (all P0.05). Of patients with postoperative hyperglycemia, 8.3% developed PE and 3.1% developed deep vein thrombosis compared with 1.8% and 0.7% in the normoglycemic cohort (P= 0.014, P= 0.003). Logistic regression analysis showed that a mean postoperative glucose value ≥180 mg/dL independently predicted PE (P= 0.029) and VTE (P= 0.008). DM diagnosis in the absence of hyperglycemia did not predict PE P= 0.221) or VTE (P= 0.195). There was no difference in SSI between groups (3.1% vs 4.3%, P= 1.00.

Conclusion: Perioperative hyperglycemia, regardless of DM diagnosis, is an independent risk factor for deep vein thrombosis and PE following fixation of geriatric femur fracture and represents a modifiable risk factor that has potential to improve outcomes.