Hemoglobin A1c as a Predictor of Surgical Site Infection (SSI) in Orthopaedic Trauma Patients

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INTRODUCTION:
Patients with diabetes mellitus (DM) and elevated hemoglobin A1c values who undergo orthopaedic surgery experience a higher rate of postoperative complications. Prior research involving DM, glycemic control, and complications in orthopaedic patients has primarily focused on elective procedures. The purpose of this study was to evaluate hemoglobin A1c as a predictor of postoperative SSI in orthopaedic trauma patients.
METHODS:
Following IRB approval, patients aged 18 years or older treated surgically for an acute fracture by a fellowship trained orthopaedic trauma surgeon with a laboratory value for hemoglobin A1c available within three months of their surgery were identified retrospectively. Patients were excluded if they underwent surgery for a diagnosis other than fracture or if they were initially treated for their fracture at an outside hospital. Postoperative SSI was defined according to “Fracture related infection: A consensus on definition from an international expert group,” by Metsemakers et al.
RESULTS: 608 patients met criteria for final analysis. There were signs of SSI in 18.9% (115/608) of patients. A receiver operating characteristic curve (ROC) was calculated using hemoglobin A1c as a predictor for SSI criteria with an area under the curve of 0.530. In patients with normal A1c levels (<6.5), an infection rate of 17.9% (66/369) was identified. This was similar to the rate of infection in patients meeting criteria for DM (49/239, 20.5%) (p=0.458). In patients with completely uncontrolled DM (A1c >10), the infection rate was 19.4% (7/36) compared with 18.9% (108/572) in patients with A1c less than 10 (p=1.00).
DISCUSSION AND CONCLUSION: Existing literature has demonstrated an association with postoperative infection in orthopaedic surgery patients who have DM and elevated hemoglobin A1c values. In this cohort of orthopaedic trauma patients, hemoglobin A1c was not a valuable tool to predict postoperative SSI. No statistical significance was identified between the rate of SSI in orthopaedic trauma patients with hemoglobin A1c values above and below the cutoff for diagnosis of DM or in those patients with completely uncontrolled DM represented by a hemoglobin A1c value >10.