

**Outcomes of Fracture Surgery in Patients with Escalating Hemoglobin A1C in the Setting of Unmanaged Diabetes,** Lawson MM, Stuart A, Ramsey KL, Friess DM, Working ZM, *J Orthop Trauma.* 2023;37(11):586-590.

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**Level of Evidence:** 3

**Reviewer:**

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It is known that high level of A1c or high level of blood glucose at the time of foot and ankle trauma surgery could increase risks of surgical complications such as post-operative infections and delayed bone healing. However, there is not a clearly defined threshold of HbA1c above which the risk of complication is so high that surgical fixation of fractures should be avoided. This study attempted to determine what the dangerous threshold level of A1c for a trauma patient was and hypothesized that in patients with uncontrolled diabetes, lower extremity fractures would have a higher rate of complications than upper extremity fractures and open treatment would have a higher rate of complications than closed treatment.

A level III retrospective study was conducted on 187 patients at a trauma I hospital between 2008 and 2018. 53.6% of patients were male while 46.4% of patients were female. 75.4% of patients were classified with Type 2 Diabetes Mellitus. The mean perioperative A1c was 8.7, with a range of 5.6–17.6. 34.8% of patients had A1c values of 9 and 12.3% exceeded 11. Many fracture types were represented with majority (77.3%) of the fractures in the lower extremity and 90.8% being classified as closed fractures. Surgical data were collected, including fracture type and type of fixation. Complications were noted, including infection, wound complications, nonunion, malunion, hardware failure, salvage procedure, and amputation. Odd ratios and area under the curve (AUC) were calculated to determine relationships between level of A1c and post-surgical complications and whether there was a linear relationship between increased A1c and increased risk of complications.

In patients with unmanaged diabetes, open fractures (63.2%) were shown to have significantly higher complications compared to closed fractures (28.2%) (P=0.0018). However, there were no differences in fracture locations and type of fracture. Further analysis showed that there was no correlation between increased A1c and rate of complications in patient with diabetes. 30.5% of the diabetic patients with fracture were shown to experience at least 1 major complication.

Severe limitations were noted to this study including the lack of immediate preoperative HbA1c values for each patient and lack of sub-analysis for complications between each HbA1c cut points. Overall, the study successfully emphasizes that in the event of foot and ankle trauma, extreme H1A1c values are not an absolute contraindication to surgical intervention.

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