Delayed Surgery Increases the Rate of Infection in Closed Long Bone Fractures in Low- and Middle- Income Countries

Francisco Gomez Alvarado, BA*; Babapelumi Adejuyigbe, BS; Aditya K. Subramanian, BS; Jamieson M. O'Marr, MSc; Michael J. Flores, MD; Patricia Rodarte, BS; Hannah Elsevier, MD; Abigail Cortez, MD; Mayur Urva, MD; Saam Morshed, MD, PhD, MPH; David Shearer, MD, MPH*

Purpose: While delays in musculoskeletal care in low- and-middle-income countries (LMICs) are well documented in the open fracture literature, the impact of surgical delays on closed fractures is not well understood. This study aims to assess the impact of surgical delay on the risk of infection in closed long bone fractures treated with intramedullary nailing in LMICs.

Methods: Using the SIGN Surgical Database, patients ≥16 years old who were treated with intramedullary nailing for closed diaphyseal femur and tibia fractures from January 2018 to December 2021 were identified. Infection was diagnosed based on the assessment of the treating surgeon. A logistic regression model, adjusting for potential confounders and interaction variables, was used to analyze the association between delays from injury to surgery and infection.

Results: Of 19,929 closed fractures included in this study, 58% were femur fractures and 42% were tibia fractures. Mean age was 35.1 years and 76.5% were male. Average delay to surgery was 22 days and the median delay to surgery was 6 days. Overall infection rate was 3.4%. The adjusted odds of developing an infection increased by 2.6% with each week of delayed surgical treatment (odds ratio: 1.026, 95% confidence interval: 1.005-1.046).

Conclusion: Surgical delays in LMICs were associated with an increased risk of infection in closed long bone fractures. We hypothesize that the increase in infection in closed fractures is driven by an increased complexity of surgery leading to longer procedure time and higher likelihood of requiring open reduction. Access to timely surgical care for closed long bone fractures should be considered a global health priority.