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

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Purpose: Musculoskeletal injury is a leading cause of disease burden worldwide. While delays in care in low- and middle-income countries (LMICs) are well documented, the impact of these delays on the outcome of closed long-bone fractures is not well understood. The aim of the current study is to assess the effect of surgical delay on the risk of infection for closed long-bone fractures.

Methods: Patients ≥16 years old with closed diaphyseal femur and tibia fractures treated with intramedullary nailing from January 2018 to December 2021 were identified using the SIGN Online Surgical Database. Patients with surgery delay >1 year and patients without any follow-up visits were excluded. Diagnosis of infection was based on the assessment of the treating surgeon. The association between time to surgery and infection was analyzed using logistic regression. To adjust for confounding, inverse probability weighting was used based on the following variables: age, sex, mechanism of injury, fracture location, hospital characteristics, and country income level.

Results: 10,781 closed femur (59%) and tibia (41%) fractures were included. The mean age was 35.9 years and 77% were male. The majority (72%) of hospitals were government-owned. The average delay to surgery was 21 days (tibia, 22.6 days; femur, 20.2 days) and the median delay to surgery was 6 days. The baseline infection rate was 3%. The probability of infection when surgery was performed within 1 week was 2.05%, 3.95% after 1 week, and 7.25% after 90 days (P<0.001). The average delay to surgery in the infected population was 42 days versus 20 days in the non-infected population (P<0.001). The odds ratio for each additional day of delay was 1.005 (1.004-1.007, P<0.001) in both the adjusted and unadjusted analysis. Excluding fractures with delays greater than 90 days increased the odds ratio to 1.013 (1.003-1.024, P<0.001).

Conclusion: There were significant delays to surgery for long-bone fractures in LMICs. This study quantifies the increased risk of infection due to delays in receiving care, highlighting the importance for timely surgery for closed fractures in LMICs.