Outcomes of Intramedullary Nailing for Traumatic Adult Femoral Shaft Fractures in Low- and Middle-Income Countries: A Systematic Review

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Purpose: Trauma accounts for more than 2 million cases of femoral shaft fractures (FSFs) worldwide, and Low- and Middle-Income Countries (LMICs) bear more than 90% of the burden of these injuries. Intramedullary nailing (IMN) has been widely accepted and long-established as the gold standard for managing FSFs in high-Income countries, yet, in comparison, less abundant literature exists on the outcomes in LMICs. This review reports findings on the radiologic and functional outcomes, and complications of managing adult traumatic FSFs with IMN in LMICs and evaluates the quality of existing evidence.

Methods: A thorough literature search was done in several databases, and the reference lists of selected articles. Screening was done per the Preferred Reporting Items in Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Peer-reviewed articles published between 2011 and 2022 that reported radiologic or functional outcomes or complications in adults with isolated traumatic FSFs managed with IMN in LMICs were included for review. Quality and level of evidence of studies were assessed using modified Critical Appraisal Skills Program (CASP) checklists and the Oxford Centre for Evidence-Based Medicine (OCEBM) criteria.

Results: 40 studies from 13 LMICs were included in this review. The mean time to union was 15.4 weeks, with a mean union rate of 90.9%. Functional outcomes scores showed >70% excellent outcomes. The Radiographic Union Scale in Tibia Fractures (RUST) score and Thoresen criteria were the most used assessment tools. Mean infection rates were 4.8%, and limb shortening of 3.5%. Findings showed variability in measuring and reporting outcomes of IMN in FSFs. However, the results showed satisfactory quality of the existing evidence.

Conclusion: Despite the data limitations and the methodological and outcomes measurement discrepancies, the findings of this review demonstrate a trend favoring IMN for FSFs, with low failure rates in low-resources settings. However, more robust studies in LMICs using standardized radiographic and functional outcomes measures are required.