Magnitude of Infection and Associated Factors in Open Tibial Fracture Treated Operatively, in Addis Ababa Burn Emergency and Trauma center, April 2023.

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Abstract

INTRODUCTION: An open tibial fracture is an injury where the fractured bone directly communicates with the outside environment. Due to the specific anatomical features of the tibia (limited soft tissue coverage), more than quarter of its fractures are classified as open, representing the most common open long-bone injuries. Open tibial fractures frequently cause significant bone comminution, periosteal stripping, soft tissue loss, contamination, and are prone to bacterial entry with biofilm formation, which increases the risk of deep bone infection. The main objective of the study was to determine Prevalence of infection and its associated factors in surgically treated open tibial fracture, in Addis Ababa Burn Emergency and Trauma (AaBET) center.

METHODS: This study employed a facility-based retrospective cross-sectional design, collecting data from patient charts at the AaBET Center from September 2018 to September 2021. A structured data collection form was used, and the collected data was entered and analyzed using SPSS version 26. Bivariable and multiple binary logistic regression were fitted. Multicollinearity was checked among candidate variables using variance inflation factor and tolerance which were less than 5 and greater than 0.2 respectively. Model adequacy were tested using *Hosmer-Lemeshow* goodness of fitness test *(P=0.711)*. AOR at 95% CI was reported and P-value < 0.05 was considered statistically significant.

RESULT: This study found that 33.9% of the study participants had an infection. Initial IV antibiotic time (AOR=2.924, 95% CI:1.160- 7.370) and time of wound closure from injury (AOR=3.524, 95% CI: 1.798-6.908), injury to admission time (AOR=2.895, 95% CI: 1.402 – 5.977). and definitive fixation method (AOR=0.244, 95% CI: 0.113 – 0.4508) were the factors found to have statistically significant association with occurrence of infection.

DISCUSSION: This study shows significant rate of infection in open tibial fractures treated at the AaBET Center. It highlights the importance of addressing factors such as time from injury to admission, time from injury to first debridement, wound closure time, and initial intravenous antibiotic time to reduce the occurrence of infection. However, being a single centered and retrospective cross-sectional study design are the limitation.

SIGNIFICANCE: The findings of this study can guide improvements in the management protocols for open tibial fractures, benefiting patients at the AaBET Center and potentially serving as a reference for healthcare facilities in developing countries in the management open tibial fracture with respect to infection prevention. As it is the first study conducted on prevalence of infection in open tibial fractures in Ethiopia, it will create the baseline information needed to test different international recommendations at our institute in the future and help to develop a local standard for our orthopaedic surgeons.

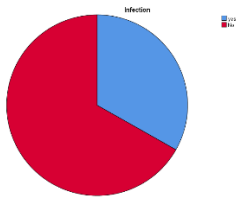

Figure 5.2 pie chart showing prevalence of infection in study population,

AaBET Hospital, Addis Ababa, Ethiopia, September 2018 to September 2021.