

Acute Alcohol Intoxication and Chronic Alcohol Use Increase Risk of Infection After Open Tibia Fractures

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Purpose: Alcohol use is recognized as a risk factor for impaired wound healing. This study sought to evaluate the impact of acute and chronic alcohol use on the incidence of surgical site infection (SSI) in patients with open tibia fractures.

Methods: A retrospective review of skeletally mature patients with open tibia fractures at an academic Level I trauma center from 2017 to 2021 was conducted. Minimum of 6-months follow up was required. Patients missing blood toxicology labs were excluded. Ethanol levels exceeding 10 mg/dL were considered ethanol positive. Daily alcohol consumption or documentation of chronic alcohol use was defined as chronic alcohol use. The primary outcome was the incidence of superficial and deep SSIs. Bivariate and multivariate analyses were performed to identify associations between alcohol use and infection rates.

Results: In total, 187 patients with 190 AO/OTA 41, 42, 43 A-C fractures met inclusion criteria; 70 patients (36.8%) had SSIs: 15 isolated superficial infections, 43 isolated deep infections, and 12 had both superficial and then a subsequent deep infection. Both acute intoxication ($p = 0.033$) and chronic alcohol use ($p = 0.005$) were associated with superficial SSI in bivariate ($p = 0.044$, OR: 2.96, 95% CI: 1.03–8.50) and multivariate ($p = 0.022$, OR: 4.70, 95% CI: 1.25–17.70) analysis. In patients with chronic alcohol use, acute intoxication further increased the risk of superficial SSI ($p = 0.036$, OR: 11.05 95% CI: 1.85–65.86). Significant risk factors for overall infection in multivariate analysis also included smoking ($p = 0.007$, OR: 2.30, 95% CI: 1.26–4.20), compartment syndrome ($p = 0.023$, OR: 2.75, 95% CI: 1.15–6.58), and severity of open fracture ($p = 0.003$, OR: 1.57, 95% CI: 1.16–2.12).

Conclusion: Alcohol intoxication and chronic alcohol use were significant risk factors for superficial SSI in patients with open tibia fractures, with compounded risk when both were present. These findings highlight the increased risk of superficial SSI and delayed wound healing in this high-risk population. To the authors' knowledge, this study presents the first investigation into the relationship between acute alcohol intoxication and SSI in orthopaedic trauma.