Marijuana Is Not Associated with an Increased Nonunion or Revision Rate of Closed Tibia Fracture Freated with Intramedullary Nailing (IMN)

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Purpose: Cannabis use is becoming more common in the United States; however, it remains unclear how cannabis affects fracture healing. This study aims to assess the relationship between cannabis use and tibial fracture healing after IMN using a large, national data source.

Methods: A retrospective review of unilateral closed tibial shaft fractures between 2015 and 2020 was performed in the PearlDiver database. Fractures treated with IMN were identified using ICD procedure codes. Demographic data collected were gender, age, Charlson comorbidity index, diabetes, obesity, and tobacco use. Dependent variables assessed were nonunion, broken implant, and revision surgery. Complications and revision rates were compared using both univariate analysis and then factor control performed via both logistic regression and propensity matched groups, matched for all demographic factors.

Results: A total of 12,951 patients sustained closed tibial shaft and IMN fixation (Cannabis: 11,230 non-users, 1,721 users). Cannabis users were younger (37.4 years ± 14.4 vs 50.7 ± 19.1, P<0.0001) and more likely to be male (68.0% vs 50.8%, P<0.0001), were less frequently diabetic and obese (odds ratio [OR] = 0.70; P<0.0001 and 0.71; P<0.0001) but more frequently used tobacco (OR = 4.05; P<0.0001). Univariate analysis demonstrated cannabis users experienced a higher rate of nonunion (4.1% vs 2.5%, P<0.001) and hardware breakage rate (1.6% vs 0.8%, P<0.001), but no significant difference in revision surgery rate (1.5% vs 1.1%). After logistic regression, cannabis remained associated with a higher broken implant rate (OR = .85, P<0.01), but not nonunion (OR =1.30, P = 0.07) or revision rate (OR = 0.85, P = 0.2). Finally, when comparing propensity matched groups, there was no difference in nonunion rate, implant breakage rate, or revision rate between the cannabis user group and non-user group.

Conclusion: Cannabis users may appear to have higher complication rate complications after IMN as seen in univariate analysis, yet this is highly confounded and likely due to other factors such as increased tobacco use in the cannabis group. Although regression analysis does account for multiple factors, propensity matched analysis provides the best comparison by creating a pseudo-randomization model of matched cohort. By this controlled analysis, there was no significant difference in the rate of nonunion, implant breakage, or revision surgery due to cannabis use, independent of other factors.