The Association Between Cannabis Use And Tobacco Use With Nonunion Of Nonoperative Management Of Scaphoid Fractures

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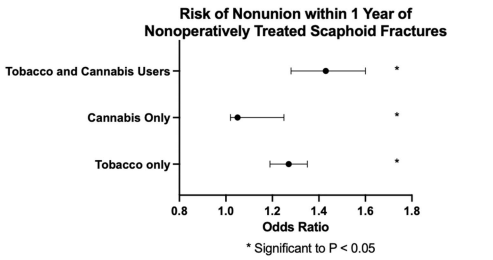
INTRODUCTION:
Nonunion following scaphoid fracture is a significant and potentially debilitating complication that may arise from both operative and nonoperative management strategies. Numerous risk factors have been identified in relation to nonunion, including characteristics specific to the fracture itself (e.g., displacement, location, comminution) as well as patient-specific variables (e.g., smoking status, comorbidities, age). The present study hypothesized that cannabis use may be independently associated with an increased risk of scaphoid fracture nonunion in patients initially managed nonoperatively. The goal of this investigation was to determine whether cannabis use, either alone or in conjunction with tobacco use, are associated with elevated rates of nonunion and subsequent surgical intervention.

METHODS:
This retrospective cohort study utilized patient data obtained from a large national healthcare database spanning the years 2010 to 2021. Adult patients diagnosed with acute scaphoid fractures who were initially managed nonoperatively were identified for inclusion. After applying the appropriate inclusion and exclusion criteria, a total of 260,806 patients were selected for analysis. These patients were classified into four distinct groups based on their documented use of tobacco and cannabis: those who used neither substance, those who used only tobacco, those who used only cannabis, and those who used both. Specifically, 165,699 patients were categorized as non-users, 75,504 were tobacco-only users, 4,225 were cannabis-only users, and 15,378 reported using both substances. To reduce potential bias and confounding, matched cohorts were created based on age, sex, and comorbid health conditions. The primary outcomes evaluated were the rates of nonunion at 6 months, 12 months, and 24 months following fracture diagnosis, as well as the incidence of surgical intervention required to address nonunion. A multivariable logistic regression analysis was performed to assess the independent association between substance use and nonunion outcomes. Statistical significance was set at a p-value threshold of less than 0.05.
RESULTS:
Patients who used cannabis, either alone or in combination with tobacco, experienced higher rates of scaphoid fracture nonunion compared to non-users and tobacco-only users. At 12 months post-fracture, nonunion was observed in 1.9% of non-users, 3.2% of tobacco-only users, 3.9% of cannabis-only users, and 6.2% of those who used both substances. By 24 months, these rates had increased slightly to 2.0%, 3.6%, 4.3%, and 6.9%, respectively. In addition to the elevated risk of nonunion, patients in the cannabis and combined-use groups were more likely to require surgical intervention for nonunion at each follow-up time point. Multivariable analysis confirmed that cannabis only users (OR: 1.05, $P=0.043$), tobacco only users (OR: 1.27, $P<0.001$), and combined users (OR: 1.43, $P<0.001$) were independently associated with increased odds of nonunion, even after controlling for demographic factors and medical comorbidities.
DISCUSSION AND CONCLUSION:
The findings of this large-scale retrospective study suggest that cannabis use, as documented in medical records, is associated with an increased likelihood of nonunion following nonoperative management of scaphoid fractures. This association appears to persist regardless of concurrent tobacco use, although the risk is most pronounced among individuals who use both substances. These results warrant further investigation into the biological and behavioral mechanisms underlying this association. Clinicians should consider discussing these potential risks with patients, particularly those who use cannabis or tobacco, during the shared decision-making process surrounding scaphoid fracture treatment.



* Significant to P < 0.05

The regression model controlled for age, gender, and all comorbidities comprising the Elixhauser Comorbidity Index (ECI).