

Is the Osseous Healing Rate Decreased by NSAIDs? A Multicenter Retrospective Study

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Purpose: The purpose of this study was to compare the time to union for ankle fractures (Weber A, B, C) between 2 cohorts given either opioids or only nonsteroidal anti-inflammatory drugs (NSAIDs) for their postoperative pain control. The 2 cohorts were selected from different geographical regions based on their primary method of pain control and their similarity in operative fixation technique. We hypothesized that there would be no statistically significant difference in the mean time to union between these 2 cohorts.

Methods: Ankle fractures presenting at 2 Level-I trauma centers, one based in the US and the other based in Chile, between the dates of January 1, 2015 and January 1, 2019 were retrospectively screened for enrollment in the study. Ankle fractures with the classification of Weber A, B, or C, which had confirmed radiographic union, were included in the study. Upon discharge the US cohort was prescribed opioid-based analgesic while the Chilean-based patients were prescribed NSAID analgesic for postoperative pain control. These postoperative pain control measures are the current standard of care in the respective countries. Union was defined as cortical bridging in 3 of 4 cortices as seen on AP and lateral radiographs. Primary outcome measure was the confirmed time to union.

Results: The mean time to union in the US cohort was 124.5 days while the mean time to union in the Chilean cohort was 137.6 days. There was no significant difference between the mean time to union between the 2 cohorts ($P = 0.159$). There was a significant difference in the mean age (49 years US vs 43 years Chilean), the proportion of smokers (46% US vs 5% Chilean, $\chi^2 < 0.005$), and proportion of open fractures (22% US vs 6% Chilean, $\chi^2 < 0.005$).

Conclusion: The mean time to union between the 2 groups was not statistically significant despite the use of different analgesics for postoperative pain management. Although there have been animal studies that have found that there are significant negative effects on bone healing with NSAID usage this study suggests that this finding may be more nuanced than originally proposed. This study found that NSAIDs may be used for postoperative pain relief without significantly compromising the time to union in ankle fractures. Prospective randomized studies are necessary to rule out the negative effect of NSAIDs on bone healing in human patients.