Postoperative Pain Efficacy of Combined IV Ketorolac and Oral Acetaminophen as Opioid Alternatives in Intramedullary Nailing of Femur Shaft Fractures

Hans W. Hess-Arcelay, MD*; Alexandra Claudio; Francis X. Cedeno, BS; Luis F. Lojo-Sojo, MD*

Purpose: This study aims to evaluate the analgesic effectiveness and opioid-sparing potential of intravenous (IV) ketorolac with oral acetaminophen compared to standard opioid therapy in the management of postoperative pain for closed femur shaft fractures treated with intramedullary nailing.

Methods: A randomized controlled trial was conducted with 71 patients divided into an experimental group (29 patients) receiving IV ketorolac with oral acetaminophen, and a control group (42 patients) receiving standard opioid analgesia. Pain levels were assessed using the visual analog scale (VAS), and opioid consumption was quantified in morphine milligram equivalents (MME) at intervals of 12, 24, 36, and 48 hours postoperatively. Nonunion and delayed healing rates were recorded for both groups.

Results: There was a statistically significant decrease in MME at every measured interval (12, 24, 36, and 48 hours) in the experimental group compared to the control group ($P<0.001$ for each time point). The VAS pain scores over the 48-hour follow-up showed no significant change at 12 hours ($P = 0.445$), 24 hours ($P = 0.300$), 36 hours ($P = 0.359$), and 48 hours ($P = 0.152$). No significant differences in union rates were observed between groups (nonunion: $P = 0.455$; delayed union: $P = 0.455$), and length of hospital stay was comparable ($P = 0.455$).

Conclusion: The results of this study indicated that IV ketorolac and oral acetaminophen were effective in reducing opioid use for postoperative pain management of patients with closed femur shaft fractures treated with intramedullary nailing. The shift to safer analgesic replacements while maintaining adequate pain control is reflected by the decrease in opioid consumption across all postoperative time intervals, as well as equivalent VAS pain scores against conventional opioids. These findings are significant given the current public health opioid crisis. The study additionally clarifies that nonopioid analgesics do not adversely affect bone healing, evidenced by comparable nonunion and delayed union healing rates. Moreover, similar hospital stay durations suggest that the nonopioid regimen does not prolong patient recovery or increase hospital resource use.