

Use of IV Acetaminophen and Ibuprofen in Surgical Patients

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Clinical Question:

In post-operative surgical patients, is the use of IV ibuprofen or IV acetaminophen an effective alternative to reduce the amount of opioids used for pain management?

Sources of Evidence:

Greenberg, S., Murphy, G. S., Avram, M. J., Shear, T., Benson, J., Parikh, K. N., & Szokol, J. W. (2018). Postoperative intravenous acetaminophen for craniotomy patient: A randomized control trial. *World Neurosurgery*, 109, 554-562.

Kroll, P. B., Meadows, L., Rock, A., & Pavliv, L. (2011). A multicenter, randomized, double-blind, placebo-controlled trial of intravenous ibuprofen (iv-ibuprofen) in the management of postoperative pain following abdominal hysterectomy. *Pain Practice*, 11(1), 23-32. doi:10.1111/j.1533-2500.2010.00402.x

Kwan, T. M., & Sullivan, M. (2017). The use of intravenous ibuprofen and intravenous acetaminophen in surgical patients and the effects on opioid reduction. *MedSurg Nursing*, 26(2), 124-131.

Synthesis of Evidence:

Three articles were examined as evidence for this report. One of the studies was systematic review while the other two studies were randomized control trials.

Kwan and Sullivan (2017) conducted a systematic review of randomized controlled studies. The review included a total of six studies that included 1139 adult patients who underwent surgeries that varied in procedure. The intervention groups included patients who received varying doses of either intravenous (IV) ibuprofen or IV acetaminophen every 6 hours for a set amount of time after surgery when the dosage of IV ibuprofen or acetaminophen given was not enough to provide adequate pain management, some type of opioid was given for additional pain relief. The findings in all six studies were consistent in the result that those who received IV ibuprofen, or IV acetaminophen had significantly reduced amounts of opioid use. One study found that the intervention group ambulated sooner than the control group while another one of the studies showed there was decreased length of hospital stay in the intervention group. Three of the six studies also reported that the intervention group reported less pain with movement.

The second study by Kroll, Meadows, Rock, and Pavliv (2011) was a randomized double-blind control trial. This study was conducted to determine the effects of IV ibuprofen on postoperative hysterectomy pain in 319 women aging from 45-70. The intervention group included patients who received 800 mg of IV ibuprofen intraoperatively and every 6 hours for the first 48 hours with the option of PCA morphine at 1-2 mg every five minutes. The control group received the placebo every 6 hours for 48 hours with the option of PCA morphine at 1-2 mg every 5 minutes. Pain assessment was done through the pain analog scale of 0-10 every 3 hours for the first 24 hours and every 6 hours for the next 24 hours. The intervention group

received only an average of 43.5 mg of morphine while the control group required an average of 54.0 mg of morphine, which represents a 19% reduction in morphine use. The intervention group reported lower pain assessment scores, both at rest and with movement during the recovery period.

Greenberg and Murphy (2018) conducted a randomized control study to determine whether opioid use during the first 24 postoperative hours was significantly altered when patients received intravenous (IV) acetaminophen during that time compared with those who received placebo. There were 140 craniotomy patients who were selected to be included in the study, but data was only included on 131 patients.

The results of the findings included that opioid requirements within the first 24 postoperative hours were similar in the placebo and acetaminophen groups. The study also found that 25% of patients undergoing craniotomies did not require opioids at all in the first 24-hour postoperative period.

Conclusion:

Evidence suggests that implementing the use of IV acetaminophen or IV ibuprofen can reduce the amount of opioid needed for pain management. Of the three articles that were reviewed, the articles by Kwan and Sullivan and Kroll, Meadows, Rock, and Pavliv indicated that when used in conjunction with opioids, the use of IV acetaminophen or IV Ibuprofen reduced the amount of opioids need to manage post-operative pain. Both of those studies had p-values that show that the results were clinically significant. The study by Greenberg et al. revealed no significant difference between the placebo group and the group that received IV acetaminophen. This result was attributed to not having a large enough same size to collect data that was clinically significant. The article by Kwan and Sullivan was a systematic review and reviewed a total of six studies which all supported the idea that using IV acetaminophen or IV ibuprofen reduced the amount of opioid needed to manage pain.

Implications for Nursing Practice:

Implementation of this practice could increase patient satisfaction with pain management, decrease the use of opioids, and decrease the potential for opioid dependence. This practice has been tested on patients receiving a variety of different surgeries and may benefit all surgical patients.