

The Efficacy of Ibuprofen

The Efficacy of Ibuprofen in Postoperative Pain and in Multimodal Analgesia

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Pain is a topic that is profoundly researched yet there is still much to discover. It is a highly personal and individualized experience, and for this reason, pain can be a challenging issue for healthcare practitioners to adequately manage in patient care. Caregivers must be attuned to the communication of pain whether it is through verbal, nonverbal, or physiological indicators.¹ Thus, management of pain has been made a standard of care by the Joint Commission. Nurses are required to assess pain on an ongoing basis throughout the hospital stay, recognize pain management and proper assessment as a right of the patient, and to appropriately educate the patient on this topic.¹⁻³ As a multidisciplinary route, involving education of both nurses and patients, and effective communication between healthcare providers and their patients, there are steps to achieve successful pain management. It is imperative that nurses are implementing evidence-based pain assessment tools and have knowledge on the proper analgesic therapies.³

One type of pain that remains a challenge to healthcare providers and demands additional research is postoperative pain in the ambulatory surgery arena.³⁻⁵ Analgesia that encompasses effective relief, expedites recovery, has minimal side effects, and is safe for home use, is the ideal analgesic for this type of setting. A well-recognized approach to achieve these goals is multimodal analgesia, combining both opioid and non-opioid medications.^{1, 3-5} For the purpose of this discussion, the non-opioid component of multimodal analgesia will be examined; specifically the medication ibuprofen, a non-steroidal anti-inflammatory drug, or NSAID.

Multimodal analgesia optimizes pain relief by acting on the peripheral and central nervous system while also reducing unfavorable opioid side effects.³ Combining analgesics

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from several pharmacological classes create a synergistic effect by engaging various mechanisms of action to aid in pain alleviation.⁴ Implementing this approach in ambulatory surgery is fundamental to a progressive recovery. Traditionally, opioids have served as the principle treatment for postoperative pain due to their potency and rapid mediation of pain. They work by binding to specific opioid receptors found primarily in the central nervous system, decreasing neuron excitability and inhibiting the transmission of pain. Despite their efficacy in treating pain, they do come with unfavorable side effects such as nausea, vomiting, decreased gastrointestinal motility, respiratory depression, sedation, pruritus, and urinary retention.⁶ To counter the potential complications of opioids, several non-opioid analgesics can be utilized as adjuvants for postoperative pain. Ibuprofen is one possible adjuvant.^{3,5}

Ibuprofen is a widely used over-the-counter medication, and for this reason, it may be undoubtedly overlooked as an effective non-opioid for postoperative pain. Non-steroidal anti-inflammatory drugs have been shown to possess anti-inflammatory, antipyretic, and analgesic properties, all of which are beneficial to treat surgical pain. Non-steroidal anti-inflammatory drugs work both peripherally and centrally to achieve analgesia. The mechanism in which peripheral pain relief is accomplished is through the inhibition of the cyclooxygenase enzyme system. This system is responsible for catalyzing arachidonic acid into prostaglandins. Prostaglandins, a type of hormone, are responsible for the inflammatory response, inducing pain, fever, and inflammation as a result of tissue injury. Decreasing prostaglandin production through the administration of NSAIDs, promotes the reduction of pain and edema. It has been found that NSAIDs also work by acting on the synthesis of prostaglandins in the central nervous system. Non-steroidal anti-

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inflammatory drugs come with their side effects as well, such as the risk of surgical site or gastrointestinal bleeding, renal and platelet dysfunction.⁵ The side effects associated with NSAIDs may not make these drugs the ideal non-opioid treatment for every patient depending on the type of surgery and risk of bleeding. Non-steroidal anti-inflammatory drugs may also be contraindicated in those with a history of renal failure or those who are at risk of renal impairment due to heart failure or hypertension and those with previous peptic ulcers or gastrointestinal bleeding. It is important to consider comorbidities and previous medical history prior to the start of any medication.

In a randomized, double blind design, the benefit of ibuprofen to treat postoperative pain in an ambulatory setting was examined. The authors of the study tested oral ibuprofen versus intravenous fentanyl for relief of pain after an ambulatory, laparoscopic surgery. Thirty patients were randomly assigned to one of two groups, one group received 800 mg oral ibuprofen and the other, 75 mcg intravenous fentanyl. Patients in the ibuprofen group took the oral ibuprofen an hour before the case and received an intravenous saline placebo intraoperatively, whereas the fentanyl group received an oral placebo an hour before the surgery and the intravenous fentanyl intraoperatively. Pain scores and reports of nausea were documented postoperatively, on the ride home, and once the patient was at home. Findings indicated that patients who had been dosed with the ibuprofen had greater and longer lasting pain relief and less nausea than those who had received fentanyl. This study's results demonstrate that ibuprofen is a competitive match to moderate-strength opioids and can be a worthy and beneficial medication for postoperative pain.⁷

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Another study that tested the efficacy of ibuprofen in management of outpatient, postoperative pain was again observed through a randomized, double-blind study. In this study, the effectiveness of the nonselective NSAID, ibuprofen was compared to the selective NSAID, celecoxib. The study enrolled 180 patients undergoing ambulatory surgery and each patient was assigned to one of three groups. Each group received one of the study medications: the placebo, ibuprofen, or celecoxib. Each medication was administered for three days postoperatively in around-the-clock dosing. To evaluate the effectiveness of these medications, patients were assessed for postoperative recovery times, pain scores, need for additional opioid analgesics, opioid-related side effects, patient satisfaction, return to daily activities, and quality of recovery. It was found that the need for additional opioid analgesics in the ibuprofen and celecoxib groups was significantly less than the placebo group; furthermore, the ibuprofen and celecoxib groups had higher ratings on quality of recovery and patient satisfaction scores than the placebo group. In regards to opioid-related side effects, only constipation was seen to be improved in both the ibuprofen and celecoxib groups, compared to the control group.⁸ This study demonstrates NSAIDs ability to be a successful and satisfactory treatment in postoperative pain and as a key protagonist in a multimodal analgesic regimen.

As rapidly evolving technology impacts the way healthcare is provided and the push for more economic patient care is demanded, ambulatory surgery takes a more central role by reducing costs and decreasing hospital stay.⁵ Minimizing a hospital stay benefits the patient by earlier resumption of daily activities, a reduction of the incidence of nosocomial infections, and postoperative complications.⁹ Management of postoperative pain is a vital issue that commands attention to accommodate the rapid surge in outpatient procedures.

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Despite the strong support for the use of multimodal therapy and the credibility of its benefits, surveys resonate the underuse of this combination therapy in the clinical setting.

³⁻⁵ Even though, only one type of non-opioid analgesic was examined here, many other pharmacological drug classes and medications exist and are used in multimodal therapy.

Those who are involved in the ambulatory setting can actively facilitate improved outcomes by supporting multimodal analgesic regimens, and specifically, non-opioid therapies, that encourage safe and effective pain relief, reduced side effects, and early resumption of activities of daily living. ^{1,5}

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