

Postoperative NSAID use and Incidence of Renal Failure in Cardiac Surgery (NIRF),

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ABSTRACT

Background: Open heart surgery increases risk for acute kidney injury, with an incidence of up to 20 to 30% following cardiopulmonary bypass, depending on definitions used. Without a widely accepted standard for pain management post-cardiac surgery – our institution has used a combination of acetaminophen, non-steroidal anti-inflammatory drugs (NSAIDs), and opioids to treat pain in these patients. NSAID use in this population may be associated with increased renal injury.

Objective: We aimed to evaluate the possible association between post-operative NSAID use and the occurrence of renal impairment after cardiac surgery.

Methods: We conducted a retrospective unmatched case-control study in adult patients who received a coronary artery bypass graft (CABG), valve replacement or repair, or a combination of the two between Feb 4, 2011 through Jan 5, 2012. The primary endpoint was a composite of the occurrence of renal risk, injury, and failure as defined by the Risk-Injury-Failure-Loss-End stage kidney disease (RIFLE) criteria from the Acute Dialysis Quality Initiative (ADQI) at 14 days post-surgery or earlier discharge.

Results: Three hundred and eighty-six patients were evaluated. Crude analysis suggested a reduction in renal impairment associated with the use of indomethacin (OR 0.42, 95% CI 0.28 – 0.64), ibuprofen (OR 0.49, 95% CI 0.32-0.75), and any NSAID use

(OR 0.57, 95% CI 0.45 – 0.74). Decreased renal impairment was also associated with increased number of NSAID doses (OR 0.94, 95% CI 0.91 – 0.97). Furosemide use was associated with increased renal impairment (OR 1.92, 95% CI 1.13-3.25). Once adjusted for age, gender, and diabetes, the analysis lost any significant association between renal impairment and NSAIDs received (OR 0.68, 95% CI 0.44 – 1.03) or total doses of any NSAID taken (OR 1.06, 95% CI 0.92 – 1.22).

Conclusions: No association between renal impairment and NSAID use post-cardiac surgery was found when adjusted for other risk factors.

RELEVANCE TO THE CSHP 2015 INITIATIVE

This study highlighted one of the ways in which clinical pharmacists in hospitals improve patient care and fulfilling CSHP 2014 Goal #1, "Increase the extent to which pharmacists help individual hospital inpatients achieve the best use of medications." The study did not show an increase in renal failure with use of NSAIDs post-cardiac surgery. However, it did demonstrate that patients who had renal impairment were less likely to receive NSAID treatment for post-cardiac surgery pain, and were also likely to receive fewer doses. This can be from the contributions of a clinical pharmacist, where the pharmacist monitors each patient's renal function daily, assess levels of pain control, and suggest a change or discontinuation of an NSAID. The pharmacist may also initiate other medications to optimize the patient's pain control. Until further studies are performed to determine if NSAID use post-cardiac surgery is associated with incidence of renal failure, hospital pharmacists can continue to monitor patients for risk of renal impairment and provide pain medication optimization.