

Journal Club Block 8: January 27 2016

Are Non-steroidal anti-inflammatory drugs safe for use in acute fractures?

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Scenario:

You are working at ABEM general, a community hospital with subspecialty back up. A 45 year old male with a past medical history of diabetes, smoking and obesity presents after he fell on a patch of ice, falling backwards and landing on his right forearm. He heard a “snap” with the fall and had immediate pain in his right forearm so presented to the ED. X-ray of the right forearm shows a mid-shaft fracture of the ulnar with minimal displacement. You place the patient in a sugar-tong splint. The patient has no PCP and you are concerned about the patient being lost to follow up so you call the orthopedic surgeon on call. He asks you to have the patient follow up in his office in 1 week and says “You can use whatever you want for pain control”. Last week you had a similar case and you talked to a different orthopedic surgeon, who did not want the patient to be placed on NSAIDs. When you posed this inquiry to this surgeon he states that he has no opposition to NSAIDs in the short term.

Clinical vignette #1: 28 year old male with no PMHx who presents with a tuft fracture of the left index finger after wrestling with his friend. You place him in a finger splint. He has an anaphylactic like allergy to opioid pain medication. On discharge how do you manage his pain?

Clinical vignette #2: 50 year old male with PMHx of smoking and obesity presents with tibia and fibular mid-shaft fractures of the right leg after a fall from a ladder. You splint the leg and arrange for the patient to be followed up with orthopedics. He has an “allergy” listed as “hives” to Vicodin. On discharge how do you manage his pain?

Background Article:

Kurmis A, Kurmis T, O'Brien J, Dalén T. The effect of nonsteroidal anti-inflammatory drug administration on acute phase fracture-healing: a review. *Journal of Bone & Joint Surgery, American Volume* [serial online]. May 2, 2012; 94-A(9):815823 9p. Available from: CINAHL Plus with Full Text, Ipswich, MA.

Discussion Articles:

Pountos I, Georgouli T, Calori G, Giannoudis P. Do nonsteroidal anti-inflammatory drugs affect bone healing? A critical analysis. *TheScientificWorldJournal* [serial online]. 2012;2012:606404. Available from: MEDLINE with Full Text, Ipswich, MA.

This article is a review of the available literature of *in vitro* animal and clinical studies on the effect of NSAIDs on bone healing. A moderate amount of the *in vitro* studies showed some form of effect on bone healing. The studies involving spinal fusion were more variable in their results but they were all retrospective studies. The randomized controlled human trials showed no effect of NSAIDs on bone healing. The clinical review concluded that the available literature on the topic presents so conflicting

data that even studies with identical parameters have opposing results. Basic science research defining the exact mechanism with which NSAIDs could interfere with bone cells and also the conduction of well-randomized prospective clinical trials are warranted. In the absence of robust clinical or scientific evidence, clinicians should treat NSAIDs as a risk factor for bone healing impairment, and their administration should be avoided in high-risk patients.

Dodwell E, Latorre J, Snyder B, et al. NSAID exposure and risk of nonunion: a meta-analysis of case-control and cohort studies. *Calcified Tissue International* [serial online]. September 2010;87(3):193-202. Available from: MEDLINE with Full Text, Ipswich, MA.

This article is a meta-analysis of case control and cohort studies on the use of NSAIDs and their effect on bone healing. They identified that a significant association between lower-quality studies and higher reported odds ratios for nonunion was observed, but when only higher-quality studies were considered no statistically significant association between NSAID exposure and nonunion was identified. They recommended that further randomized controlled trials assessing NSAID exposure in fracture, fusion, and osteotomy populations are warranted to confirm or refute their findings.

Nonsteroidal anti-inflammatory drugs' impact on nonunion and infection rates in long-bone fractures. Jeffcoach, David R; Sams, Valerie G; Lawson, Christy M; Enderson, Blaine L; Smith, Scott T; Kline, Heather; Barlow, Patrick B; Wylie, Douglas R; Krumenacker, Laura A; McMillen, James C; Pyda, Jordan; Daley, Brian J; University of Tennessee Medical Center, Department of Surgery; *Journal of Trauma & Acute Care Surgery*, Mar2014; 76(3): 779-783. (5p) (Journal Article - research) ISSN: 2163-0755 PMID: 24553548 AN: 107887650

This article was a retrospective study of all patients with femur, tibia, and/or humerus fractures between October 2009 and September 2011 at a Level 1 academic trauma center. They found that a patient is significantly (2 times) more likely to have a complication if he or she received an NSAID in the inpatient postoperative setting. Also, smokers are significantly (3 times) more likely to have complications.

Discussion:

Our journal club discussion centered around whether these studies present enough evidence to change how we practice in the emergency department in the treatment of patient with acute fractures. From our discussion we concluded that the strongest studies show no effect of NSAIDs on bone healing. However as emergency physicians we work closely with our consultants, orthopedic surgeons in this case, who frequently request or desire that their patients do not receive prescription NSAID medication for acute fracture management. Also, the background article and the discussion articles show that there is a theoretical effect on bone healing which also has been shown in *in vitro* studies and multiple retrospective studies. Overall the consensus from my journal club discussion was that the strongest studies (randomized controlled) looking at the effect of NSAIDs on bone healing are few and they do not show any significant effect on bone healing. However given the concern of NSAID use in acute fractures in the orthopedic community, the cautious use of them for analgesia in acute fractures presenting to the ER is prudent, especially for smokers and patients with other risk factors for poor bone healing.