Paramedic – Evidence Based Medicine (P-EBP) Program

Paramedic CAT (Critically Appraised Topic) Worksheet

Title: *Clinical effectiveness of split dose Ketorolac in acute pain and renal colic patients.*

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Clinical Scenario: *A patient is being transported long distance for further treatment of Renal Colic. Your patient begins to experience increasing pain and you have no ability to call for Advanced Care backup for Morphine or similar. You initiate a 15mg IV dose of Ketorolac to the patient to ease his discomfort. 30 minutes later the patient begins to experience increasing pain so you administer the second 15mg Ketorolac IV dose to ease his discomfort. After the two doses, the patient makes it with minimal discomfort to the receiving hospital.*

PICO (Population – Intervention – Comparison – Outcome) Question:
In Acute Pain and Renal Colic, does a double15mg Ketorolac medication dose have any comparison to the standard 30mg Ketorolac dose used in Emergency Settings?

Search Strategy:
((((pain OR renal colic OR in hospital OR in-hospital OR out of hospital OR OOH OR out-of-hospital OR paramedic OR emergen* OR EMS OR emergency medical services OR back pain))) AND ((toradol OR toradol 15 OR toradol 30 OR ketorolac OR ketorolac 15 OR ketorolac 30))) AND ((effect OR effectiveness OR pain relief OR decreased pain OR pain control))*

Search Outcome:
1368 initial search outcomes were present on the initial P-EBP search platform.

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Relevant Papers:

AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/ WEAKNESSES
Duttchen.K, FRCP, Lo. A MD, Walker. A PhD, McLuckie. D FRCP, De Guzman. C FRCP, Roman-Smith. H MSc, Davis. M FANZCA - 2017	*50 adult patients 18-65 years old undergoing lumbar decompression spinal surgery.*	*This article was a Level 1 randomized control trial, with two groups (A - 15mg and B – 30mg) intraoperative doses.*	*Study is to show the non-inferiority of the 15mg Ketorolac vs. the standard 30mg Ketorolac dose.*	*According to the study there was no statistic or clinical difference between the 15mg dose and the 30mg dose when it came to pain and rescue opioids (P=0.332)*	*Well controlled study, however did not directly apply to Paramedic level of study or EMS systems. Would be a good study for basis however.*
Catapano. M MD - 1994	*There were no sample or trial patients with this article. This article was a research paper on the Analgesis Efficacy of Ketorolac.*	*This article was a level 2 research article comparing various doses and routes of administration for Ketorolac.*	*In this past study, it was found that Ketorolac did have an analgesic ceiling for pain and was a good substitute for other NSAIDS and decrease opioid dependency in pain management.*	*Research showed the usefulness of Ketorolac in decreasing opioid dependency and also was a better pain reliever than opioids alone in patients with moderate to severe pain intravenously.*	*This article was published back in 1994, and since then there has been a lot of scientific advancements and studies in regards to Ketorolac for pain management.*
Safdar. B MD, Degutis. L DrPH, Landry. K MD, Vedere. S MD, Moscovitz. H MD, D'Onofrio. G MD - 2006	*555 patients aged 18-55 years old with diagnosis of acute renal colic were subject to the study. 158 met inclusion, and 130 were randomized during 6 months.*	*This article was a Level 1 prospective double-blinded randomized control trial.*	*The outcomes were to determine the pain reduction and need for rescue analgesia at 40m minutes with Morphine vs. Ketorolac.*	*Study showed the slim difference between the Morphine (2) dosing and the Ketorolac(2) dosing to be P=0.003 and Morphine and Ketorolac combined was P=0.007 for rescue.*	*Well controlled study with vast patient contacts (130). Exact differences between primary opiate and Ketorolac. Could be modified and applied to EMS setting.*

Comments: *There were a lot of good and useful articles around Ketorolac; however none were centered on the EMS or Paramedic settings. These articles were the best found and suited for my study at the time.*

Consider: *There is not enough evidence at this time to shift a change in EMS or Paramedic settings. I believe a randomized control trial could be tweaked and initiated in a setting with patients and could be quite successful at decreasing the need for opiate medication and opiate dependency in hospital.*

Clinical Bottom Line: *Although found effective, the lower double Ketorolac dosing requires more field study.*

References: *The following articles were cited for this present CAT project.*

1 – Journal of Clinical Anesthesia – Elsevier 2017 Multiple Authors as cited.
2 – Pharmacology of Emergency Medicine – Elsevier 1994 Michael S. Catapano, MD and as cited.
3 – Annals of Emergency Medicine – Volume 48, No. 2 – 2006 Multiple Authors as cited.