Paramedic – Evidence Based Medicine (P-EBP) Program

Paramedic CAT (Critically Appraised Topic) Worksheet

Title: *Using Metoclopramide versus Dimenhydrinate in the presence of opioid induced nausea or nausea and vomiting*

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Clinical Scenario: *On scene with your 25yr old male closed tib/fib fracture you decide analgesia is necessary to move this Pt. The Pt informs you that he has never been given opioids. Thinking ahead you believe it would be prudent to prepare an antiemetic to treat any associated nausea. On hand is Dimenhydrinate; This drug has been around longer, you've given it hundreds of times, it is quick and easy to prepare and deliver. On the other hand, you have Metoclopramide; This drug is much newer, you've only administered it a handful of times and prep time is slightly increased due to an infusion with saline and a drip run over 10 minutes.*

Which medication do you choose?

PICO (Population – Intervention – Comparison – Outcome) Question:
In Pts experiencing nausea after the administration of opioid pain control, should the recommended dosage of Metoclopramide be administered in place of Dimenhydrinate? Is there a difference in symptom relief?

Search Strategy:
Acute pain OR nausea AND Metoclopramide OR Dimenhydrinate AND morphine OR morphine analgesia

Search Outcome:
700

Relevant Papers:

AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/ WEAKNESSES
Lu CW 2010	*200 women scheduled for abdominal total Hysterectomy.*	*double-blind, and all clinicians were blinded to patient allocation.* *group 1, morphine 1 mg ml1 ; group 2, morphine 1 mg ml1 with metoclopramide 0.5 mg ml1 ; group 3, morphine 1 mg ml1 with diphenhydramine 0.6 mg ml1; and group 4, morphine 1 mg ml1 with metoclopramide 0.5 mg ml1 and diphenhydramine 0.6 mg ml1* *Level 2*	*Assess whether antiemetic drugs metoclopramide and diphenhydramine, administered together as opposed to alone, can have better efficacy in preventing postoperative nausea and vomiting when added to patient-controlled morphine analgesia.*	*The incidence of nausea was significantly (P < 0.05) lower in group 4 compared to the other groups. In addition, there was a significant (P 1/4 0.006) difference in the incidence of vomiting between groups 1 and 4. Repeated measurement analysis showed that numeric rating scale scores for group 4 were significantly (P < 0.001) lower than those for the other groups.*	*No obvious flaws were observed in this report* *The sample size is adequate shown in the reports Sample-size determination* *Although the test is conducted with a specific postop population the study seems to show a positive synergistic affect with the combination of drugs prophylactically to morphine. Both antiemetics are carried by many EMS* *This study appears to be well randomized by means of double blinded participants and demonstrates a high degree of trust*

					through their work.
AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/ WEAKNESSES
Bradshaw M. 2005	259 patients presenting at ED over 2-year period who did not meet exclusion criteria, determined to require IV morphine treatment.	A randomised controlled trial was carried out on patients requiring morphine for acute pain in the emergency department (ED) setting. A prospective, randomised, double blind, placebo controlled trial over 24 months (July 2001 – June 2003). The North East Wales NHS Trust ethics committee approved the study. Level 2	The aim of this study was to compare the incidence of nausea and vomiting in patients with acute pain treated with morphine along with prophylactic metoclopramide or placebo.	test was used for comparing the two groups of patients. Results: A total of 259 patients were recruited. There were 123 patients in the metoclopramide group (age range 15–94 years; median age 53) and 136 patients in the placebo group (age range 17–93 years; median age 52.5). The overall incidence of nausea and vomiting in the whole study population was 2.7%, (1.6% in the metoclopramide group and 3.7% in the placebo group). The difference between the two groups were not statistically significant (Fisher's exact test = 0.451; p = 0.3; z-test statistic = 1.02; 95% CI – 6% to 2%).	Despite a 2-year duration the sample size obtained in this study was too small to provide enough statistical power. Logistically limiting was the facilities ability to provide the resources to conduct the trials long term. Primary medications of study in this trial are available to many EMS. Randomization was appropriately conducted and double blinded. This study appropriately disclaims it's findings as insignificant

Comments: *Few if any studies are currently published on the topic of Metoclopramide Vs Dimenhydrinate (Diphenhydramine + 8-chlorotheophylline) in the presence of opioid induced nausea or nausea and vomiting. The most comprehensive research appears to have been conducted in postoperative environments; when considering the relative, literal and metaphorical distance from the prehospital setting, general inferences from these trial results are inconclusive.*

Consider: *The articles highlighted in this report all involve the prophylactic use of an antiemetic(s) with routine use of morphine intravenous. This concept is not a standard guideline/practice in Nova Scotia EHS. Based on the results of these trials prophylactic use of an antiemetic(s)may not have a very high incidence of efficacy.*

Although prophylactic use of an antiemetic(s)with morphine seemed to show low incidences of efficacy, the use of two antiemetics with different mechanisms of action did appear to show a significant increase of efficacy when compared to single antiemetic administrations.

Clinical Bottom Line: *Based on both studies there appears to be a low incidence of opioid induced nausea when administered and titrated correctly. There is little evidence that supports the use of prophylactic antiemetic(s) with morphine administration being beneficial.*

These studies highlight the possibility that different antiemetics in combination may provide a better therapeutic threshold for our patients regarding both pain control (requiring less analgesia to achieve the same pain reduction) with minimized adverse affects such as nausea.

Both Metoclopramide and Dimenhydrinate could/should be used in combination as a reaction to opioid induced nausea when contraindications do not exist.

References:

Cheng-Wei Lu, Wei-Horng Jean, Chia-Chan Wu, Jiann-Shing Shieh and Tzu-Yu Lin. Antiemetic efficacy of metoclopramide and diphenhydramine added to patient-controlled morphine analgesia: a randomised controlled trial. Eur J Anaesthesiol 2010;27:1052–1057

M Bradshaw, A Sen. Use of a prophylactic antiemetic with morphine in acute pain: randomised controlled trial. Emerg Med J 2006;23:210–213.