Maine Medical Center
Department of Emergency Medicine
Journal Club Summary Template

Date:4/22/21	**Presenter Name: James Sledd, MD**

Article Citation: Motov S. et al. Comparison of intravenous lidocaine/ketorolac combination to either analgesic alone for suspected renal colic pain in the ED. American Journal of Emergency Medicine. 2020 Feb; 38 (2): 165-172.

Country(ies):
New York, USA

Funding Source(s):

☒ None Stated

Purpose

Research Question(s):
Is the combination of lidocaine and ketorolac more effective than either lidocaine or ketorolac alone in adults with suspected renal colic?

☐ None Stated

Hypotheses:
The combination therapy will be more effective than either alone.

☐ None Stated

Study Purpose:
Evaluate a method of pain control for kidney stones that may have fewer side effects or better efficacy than existing treatments.

Methods

Study Design:
Randomized, double-blind trial with 3 different arms: lidocaine 1.5 mg/kg, lidocaine 1.5 mg/kg + 30mg ketorolac, or ketorolac alone.

Outcome(s) *[or Dependent Variable]:*
Pain scores (NRS), as well as rates of adverse events and need for rescue analgesia.

Intervention *[or Independent Variable]:*
lidocaine 1.5 mg/kg, lidocaine 1.5 mg/kg + 30mg ketorolac, or ketorolac alone.

Ethics Review: ☐ IRB Review ☐ IACUC Review ☐ Other: ☒ None Stated

Research Setting:
Maimonedes Medical Center, urban community ED with >120,000 visits/year in New York City

Study Subjects:
Convenience sample, between November 2016 and October 2018, Monday-Friday, 8a-8p.

Inclusion Criteria:

Adults age 18-64 with pain anywhere between the costal margin and the groin suspected to be renal colic by the ED physician who required IV pain control.

Exclusion Criteria:
Agee of 65 or up, documented or suspected pregnancy, allergy or contraindications to study medications, known liver or kidney dysfunction, **use of NSAIDs or opioids within 4 h prior to presentation,** predisposition to bleeding including anticoagulation, history of GI ulcer or bleeding, history of arrhythmia, severe CAD, seizures, peritonitis, altered mental status, heart rate less than 50 or greater than 150, or **body mass more than 100 kg.**

Study Interventions:
See above. In addition, rescue morphine 0.1 mg/kg could be used at 30 and 60 minutes.

Study Groups:
See above

Instruments/Measures Used:
Visual analogue pain scale from 0-10 with a clinically significant difference of 1.3 points.

Data Collection:
A research fellow and research assistants under the supervision of three treating physicians enrolled patients and recorded pain scores, vital signs, and adverse effects at 15, 30, and 60 minutes.

Data Analysis:

***A priori* sample size calculation?** ☒ Yes ☐ No ☐ Not Described ☐ N/A

Statistical analyses used: Paired t-tests to examine changes over time in each group; multilevel analyses to evaluate **different rates** of improvement.

Adjustment for potential confounders? ☐ Yes ☒ No ☐ Not Described ☐ N/A
If yes, list:

Results

Study participants:

181 participants approached. 150 subjects enrolled, 50 in each group.

Brief answers to research questions *[key findings]:*

Pain scores at 30 minutes
- Lidocaine alone: 5.5
- Ketorolac alone: 3.88
- Combination: 3.14

This difference was neither statistically nor clinically significant.

Additional findings:

The combination group had more adverse effects, most notably dizziness, nausea/vomiting, and perioral numbness.

Limitations:

Not powered to detect safety differences.

Clinical Implications
Applicable? Yes—this is a very common presentation in our ED **Feasible?** Yes—these are widely used and readily available medications. **Clinically relevant?** Yes! I see a kidney stone basically every shift and pain control is the first goal. **Comments:**

Level of evidence generated from this study

- ☐ Ia: evidence obtained from meta-analysis of randomized controlled trials
- ☒ Ib: evidence obtained from at least one randomized controlled trial
- ☐ IIa: evidence obtained from at least one well-designed, controlled study without randomization
- ☐ IIb: evidence obtained from at least one other type of well-designed quasi-experimental study
- ☐ III: evidence obtained from a well-designed, non-experimental study
- ☐ IV: expert committee reports; expert opinion; case study; case report

Additional Comments/Discussion/Notes

I would not add lidocaine and would certainly not use it alone. Toradol seems to work very well (see other papers this month) even as well as morphine. In addition to no improvement over Toradol alone, lidocaine had an increased rate of adverse effects.

This paper had broad exclusion criteria. Ones I find notable are use of pain medicine within 4 hours of arrival (this is a ton of patients) and weight greater than 100 kg.

Note the dose of morphine here, and in other papers this month. We often **underdose it**. Our EMR defaults to 4 mg, which would be appropriate for a 40 kg/90 pound person. The appropriate dose for me would be 9 mg. The equianalgesic dose of 1 mg hydromorphone is about 7.5 mg. We often don't hesitate to give this dose twice, or about 15 mg of IV morphine. Don't hesitate to give the appropriate dose!