Intranasal Ketamine for Analgesia (INKA) in the Emergency Department: A Prospective Observational Series

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Background
- Timely analgesia is integral in the emergency department (ED).
- Intravenous (IV) opioids are used frequently, and their use is often delayed (e.g. cardiorespiratory monitoring required).
- Ketamine has shown efficacy as an analgesic in a variety of settings at sub-anesthetic doses, and obviates many of the concerns of opiates (e.g. no cardiorespiratory depression).
- The intranasal route has demonstrated excellent absorption and has many advantages vs IV therapy (e.g. shorter time to administration).

Methods
- Design: Open-label, non-randomized, uncontrolled trial.
- Patients recruited as convenience sample (10/2012-01/2013).
- Sample size: 40
  - To detect a change in visual analog scale (VAS) of ≥13mm with a power of 80% (alpha = 0.05), 34 subjects were needed.
- Six patients were added to offset potential dropouts.

Inclusion:
- ≥6 years of age with moderate or severe pain (VAS ≥50mm).

Exclusion:
- Pregnancy, history of schizophrenia, need for immediate IV access, uncontrolled hypertension (SBP> 180mmHg), nasal occlusion, or Glasgow Coma Scale <15.

Intervention:
- 0.5mg/kg INK given via mucosal atomization device.
- A single, repeat dose of 0.25 mg/kg of INK could be given after 10 minutes if the recorded VAS was ≥50 mm.

Outcomes measurements:
- Pain scores and vital signs were taken every 5 minutes for the first 30 minutes, then every 10 minutes for up to 1 hour.
- All subjects completed a study questionnaire providing demographic and pain data at baseline, and at 5, 10, 15, 20, and 30 minutes after INK administration.
- Patients were screened for adverse events every 10 minutes.
- Satisfaction and nasal irritation were assessed at 30 minutes.
- Follow-up interviews were performed at 24 and 72 hours.

Statistical Analysis:
- Wilcoxon Signed-Ranks Test.

Results
- Twenty-three subjects (58%) required 2 doses of INK.
- A clinically significant reduction in pain (VAS reduction of ≥13mm) was attained by 88% of this study population within 30 minutes.
- Nineteen of 40 subjects (48%) achieved this reduction by 5 minutes.
- No significant changes in O2 saturation, blood pressure, or respiratory rate.
- All adverse effects were transient and did not require intervention.

Limitations
- Open-label: performance and detection bias.
- No comparison group: unable to assess magnitude of placebo effect, compare to standard care.
- Small sample size: limits generalizability and ability to identify uncommon adverse reactions.

Conclusions
- INK given at doses of 0.5 to 0.75 mg/kg reduces VAS pain scores to a clinically significant degree (i.e. ≥13mm reduction in VAS) within 30 minutes.
- Adverse effects were mild and transient.
- INK may have a role in the provision of expedited, non-invasive analgesia to ED patients.