DEM Journal Club

Article Appraisal

Article: Isopropyl Alcohol Nasal Inhalation for Nausea in the Emergency Department: A Randomized Controlled Trial

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Background and Study Objective(s):

Nausea is a frequent symptom of patients presenting to the ED. Research has suggested that commonly used anti-emetics do not outperform placebo in undifferentiated patients in the ED setting. In the anesthesia literature, isopropyl alcohol has been found to be effective in the treatment of postoperative nausea. Prior to this study, no research has explored whether isopropyl alcohol could function as an effective anti-emetic in the ED setting. This study set out to compare the efficacy of nasally inhaled isopropyl alcohol vs. placebo (nasally inhaled normal saline) in alleviating nausea.

Study Design:

The study was a double-blind randomized controlled trial. Nurses identified patients presenting to the ED with nausea who met specific inclusion/exclusion criteria. A non-study investigator assigned treatment group allocation based on a computer-generated randomization sequence. Demographic and baseline information was collected to allow assessment of similarity between the two groups. Isopropyl alcohol and normal saline soaked pads were blinded from investigators and subjects using taped coverings with a small removable opening. Subjects inhaled from their assigned pads at 0, 2, and 4 minutes, and the study was deemed completed at 10 minutes. The primary outcome was nausea as measured on a previously validated 11-point Verbal Numeric Response Scale (VNRS). Secondary outcomes included pain (also on a VNRS scale), satisfaction post-study on 5 point Likert scale, as well as use of rescue anti-emetics after study completion. Analyses were conducted via Intention to Treat and nonparametric statistical methods were used.

Results:

Baseline characteristics were similar, with the exception of higher initial pain scores in the isopropyl alcohol group. Patients allocated to the isopropyl alcohol group were found to have lower nausea scores at 10 minutes than placebo (median score of 3 vs. 6 on the 11 point scale, $p<0.001$) giving an effect size of 3 (95% CI 2-4), a difference that exceeded the a priori defined minimum clinically important difference. The isopropyl alcohol group also had higher satisfaction scores (median score of 4 vs. 2 on the 11 point scale). There were no statistically significant

differences between pain scores and no difference in the number of patients requiring rescue anti-emetics. No serious adverse effects were reported in either group.

Validity of Results:

The sense amongst Journal Club attendees was that the results were valid, though a few issues were raised during discussion. First, questions were raised as to whether this was truly a "blinded" study. Isopropyl alcohol has a distinctly noticeable smell as compared with normal saline. The investigators did however make attempts to account for this. Subjects were not provided any information about the nature of the substances they would be inhaling, and additionally were instructed to refrain from making faces in reaction to any smell. In order to blind the investigators, patients that were unable to open the pad packaging themselves had pads opened for them by investigators holding and opening the packages at arm's length. A brief and amusing (though unscientific) trial at the Vancouver Journal Club involved attendees holding an open isopropyl alcohol pad at a similar arm's length distance. Most reported not being able to smell the contents of the pad. Second, it was noted that previous reviews of this study posted on FOAMed sites had raised the question of whether a more 'objective' measure of nausea should have been used (e.g. number of episodes of vomiting and length of ED stay). However, Journal Club attendees felt that the VNRS scale was sufficient as it is reflects criteria typically used for interventions in the ED, namely the relief of perceived (and therefore subjective) discomfort, including nausea.

Generalizability of Results:

The results of this study were felt to be broadly generalizable. Although military medical facilities such as the site for this study typically serve younger, healthier, lower acuity patients, attendees could think of no reason why the observed benefits from isopropyl alcohol inhalation for nausea would not also be applicable to BC ED's. External validity could have been enhanced had the study been multicenter with a larger sample size.

The Bottom Line:

The results of this study were felt to provide convincing evidence that, post-triage but prior to being seen by an EP, isopropyl alcohol inhalation is a transiently effective and safe therapy that could be used as a bridge to further treatment. It was noted that as no ED studies have shown superiority of traditional anti-emetics compared with placebo, a potential exists for further research into the use of isopropyl alcohol inhalation in the ED setting in direct comparison with another scent soaked pad as well as traditional anti-emetics beyond the short (10 min) period assessed by this study.