No IV, No Problem: A Cross Sectional Analysis of Antiemetic Therapies in Statewide EMS

Carlin C. Chuck, NREMT[1]; Thomas J. Martin, BA, NRP[1,2]; Isabelle H. Moseley, NREMT[1];
Megan L. Ranney, MD, MPH, FACEP[2,3]; Nicholas Asselin, DO, MS[1,2,4].

[1]Brown University EMS, Providence, RI; [2]The Warren Alpert Medical School of Brown University, Providence, RI;
[3]Emergency Digital Health Innovation, Brown Emergency Medicine, Providence, RI; [4]Division of EMS, Brown Emergency Medicine, Providence, RI.

Background

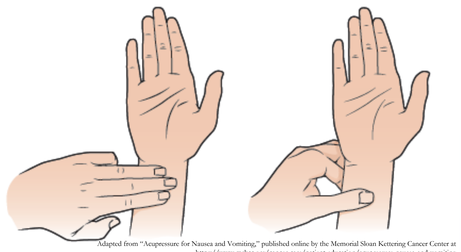
Nausea is a common reason for presentation to the ED in the United States and is noted as a complaint in almost five million visits annually.[1] Prehospitally, nausea may represent up to 10% of chief complaints.[2] CBEMS providers frequently encounter nausea secondary to consumption of alcohol or other drugs. Though a recent randomized controlled trial demonstrated that among ED patients, aromatherapy with isopropyl alcohol with or without oral Zofran (ondansetron) provided greater relief of nausea than oral Zofran alone,[3] there is a paucity of data on the availability and effectiveness of similar noninvasive antiemetic strategies in the prehospital setting.

As the prehospital management of nausea varies with individual licensure and local protocol, we hypothesized that CBEMS agencies operating at the BLS level may face limited options for antiemetic therapy. Herein, we survey the availability of BLS antiemetics within statewide EMS protocols and provide preliminary data on their impact in terms of number of affected CBEMS agencies.

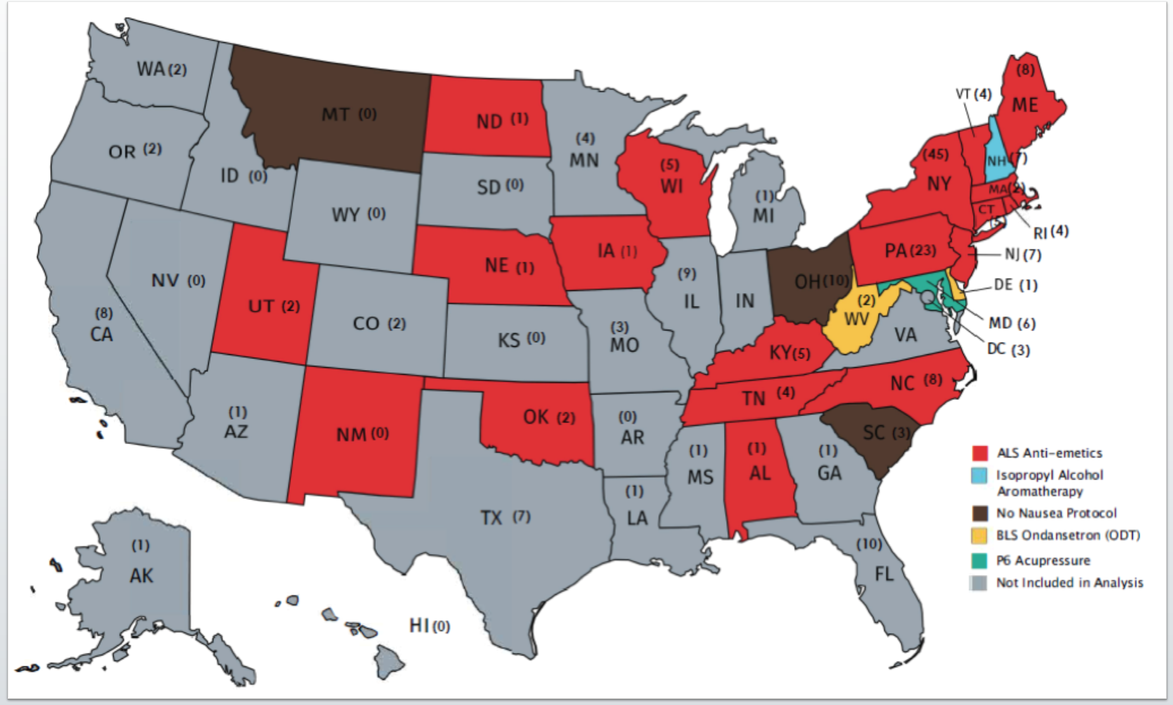
"Antiemetics in Action"

Isopropyl Alcohol Aromatherapy

P6 Acupressure



Adapted from "Acupressure for Nausea and Vomiting," published online by the Memorial Sloan Kettering Cancer Center at https://www.mskcc.org/cancer-care/patient-education/acupressure-nausea-and-vomiting



Methods

A cross-sectional analysis of publicly available statewide EMS protocols published within the last decade was completed in October 2018. The presence of a protocol for nausea management at the BLS level was defined the primary outcome of interest; secondary outcomes including the availability of oral (ODT) ondansetron or alternative antiemetic agents were also defined *a priori*. The number of CBEMS agencies in each state was gathered from registry data available through the National Collegiate Emergency Medical Services Foundation.

Two trained reviewers independently collected data using standardized abstraction forms; interrater reliability was assessed using Cohen's κ with discrepancies resolved by the senior author. Descriptive statistics were generated using *R* v3.3.2 (The R Foundation for Statistical Computing, 2018). This study is exempt from IRB review.

Results

30 model or mandatory statewide EMS protocols were identified using aggregate databases and internet searches; data were abstracted with κ=1.

13.3% (4/30) of states adopted BLS nausea protocols: two allow ODT ondansetron, one allows isopropyl alcohol aromatherapy, and one allows P6 acupressure.

There were no protocols identified that allow intramuscular antiemetics at the BLS level. 70% (21/30) of state protocols include ODT ondansetron, and 90.4% (19/21) of these restrict administration to ALS providers. 46.7% (14/30) of states include alternative antiemetics such as promethazine and metoclopramide, often as second-line "rescue" therapies following ondansetron administration.

Corresponding Author: Thomas J. Martin, thomas_martin@brown.edu.

Discussion/Conclusion

CBEMS agencies operating at the BLS level are unable to administer ondansetron intravenously or intramuscularly. Though ODT ondansetron and isopropyl alcohol aromatherapy are safe and effective for nausea management in the ED, prehospital adoption remains low. As the majority of CBEMS agencies are unable to provide advanced life support, options for treatment of nausea in the collegiate setting are thereby limited. Further research should assess the feasibility, safety, and efficacy of introducing noninvasive antiemetic therapies prehospitally at the BLS level – their implementation will offer exciting options for CBEMS providers.

References

[1]Myer, P. A., Mannalithara, A., Singh, G., Singh, G., Pasricha, P. J., and Ladabaum, U. 2013. "Clinical and Economic Burden of Emergency Department Visits Due to Gastrointestinal Diseases in the United States." The American Journal of Gastroenterology, 108(9), 1496–1507.
[2]Easton, Ruth, Cino Bendinelli, Krisztian Sisak, Natalie Enninghorst, and Zsolt Balogh. 2012. "Prehospital Nausea and Vomiting after Trauma: Prevalence, Risk Factors, and Development of a Predictive Scoring System." The Journal of Trauma and Acute Care Surgery 72 (5): 1249–53; discussion 1253–54.
[3]April, Michael D., Joshua J. Oliver, William T. Davis, David Ong, Erica M. Simon, Patrick C. Ng, and Curtis J. Hunter. 2018. "Aromatherapy Versus Oral Ondansetron for Antiemetic Therapy Among Adult Emergency Department Patients: A Randomized Controlled Trial." Annals of Emergency Medicine 72 (2): 184–93.