

(i.e supine to an inclined or reverse case). Second, predetermined conditions prior to intubation may be needed to be controlled and further subgroup analysis would show more clinical implication. Authors already performed age-stratification. Indication for intubation would be the main interest for stratification, too. Respiratory failure indication was more frequent in an inclined position (71.0%) and airway protection indication was more frequent in a supine position (79.7%), as authors already described. The two indications are clinically very different, thus stratified analysis for laryngeal view between inclined and supine position in respiratory failure only group and airway protection only group would be expected to reveal clinical implications. Additionally, subgroup analysis among patients who were anticipated difficult airway and patients who were not would give more detailed information regarding laryngoscopic visualization. Status of secretions, obesity, emesis or blood condition is already collected in this study. It would be useful to inform which conditions would be beneficial for an inclined position than supine position before attempting endotracheal intubation.

Financial support

None.

Declaration of Competing Interest

None.

Sion Jo, PhD
Jae Baek Lee, PhD

Corresponding author at: Department of Emergency Medicine, College of Medicine, Chonbuk National University, 20, Geonjiro, Deokjin-gu, Jeonju 54907, Republic of Korea.
E-mail address: baeklee@jbnu.ac.kr.

27 April 2019

<https://doi.org/10.1016/j.ajem.2019.05.027>

Reference

- [1] Murphy DL, Rea TD, McCoy AM, Fahrenbruch C, Yin L, et al. Inclined position is associated with improved first pass success and laryngoscopic view in prehospital endotracheal intubations. *Am J Emerg Med* 2019;37(5):937–41.

Response: Inclined versus supine position for endotracheal intubation



We thank Professor Jae Baek Lee and colleagues for their interest in our study. A primary concern expressed was the possibility that patient position was altered throughout the course of care for patients needing more than one intubation attempt to successfully place an endotracheal tube. While other details about subsequent intubation attempts are well characterized in our airway registries, unfortunately the patient position is recorded only for the first attempt at tracheal intubation. We too are interested in the techniques undertaken by paramedics following an unsuccessful attempt at intubation, including patient position.

We agree that analysis of outcome stratified by clinical indication for intubation is of clinical import and would help further ascertain which patient cohorts benefit most from this intervention. We are modifying our airway registry to collect additional information and plan to return to this important question in the future.

The question of evaluating outcomes based on anticipated airway difficulty is interesting. Unfortunately, our airway registries did not

collect information regarding the pre-intubation airway assessment by the team performing the procedure. Airway assessment tools are taught to prehospital providers in our system, but their clinical utility is modest [1], and of uncertain applicability in the emergent prehospital setting where every airway should be approached like a difficult airway.

We agree that there are potential confounders that limit our study findings. We cannot be certain if the improved first pass success rate or view on laryngoscopy among the inclined patients was due directly to positioning or is a confounding characteristic. We would welcome further work utilizing prospective data collection methods that could specifically investigate the characteristics highlighted by the reader.

David L. Murphy, MD*

Department of Emergency Medicine, University of Washington, Seattle, WA, USA

*Corresponding author at: Department of Emergency Medicine, University of Washington, Harborview Medical Center, USA.
E-mail address: dlmurphy@uw.edu.

Thomas D. Rea, MD, MPH

Department of Medicine, University of Washington, Seattle, WA, USA
King County Emergency Medical Services, Seattle, WA, USA

Michael R. Sayre, MD

Department of Emergency Medicine, University of Washington, Seattle, WA, USA
Seattle Fire Department, Seattle, WA, USA

9 May 2019

<https://doi.org/10.1016/j.ajem.2019.05.028>

Reference

- [1] Detsky ME, Jivraj N, Adhikari NK, et al. Will this patient be difficult to intubate?: the rational clinical examination systematic review. *JAMA* 2019;321(5):493–503.

HVNI vs NIPPV in the treatment of acute decompensated heart failure: Is acute stabilization enough?



To the Editor,

We agree with Haywood et al. that HVNI could be non-inferior to NIPPV in the management of patients with acute decompensated heart failure [1]. As this study is a subgroup analysis of a larger study, there are some key issues that need to be addressed for meaningful clinical extrapolations.

The authors have included patients with a discharge diagnosis of acute decompensated heart failure without differentiating between patients with reduced and preserved ejection fraction. Furthermore, the inclusion of patients was subjective viz. patients requiring escalation of support to NIPPV without further characterization of the severity or etiology of heart failure. This is concerning, as existing evidence suggests that NIPPV may be harmful in patients with cardiogenic shock and may increase risk of acute coronary syndrome [2]. The existence of comorbidities such as chronic obstructive pulmonary disease (COPD) is not accounted for and could impact the findings. Thus, these results may not be applicable to the complete spectrum of heart failure patients.

Secondly, the authors have mentioned initial settings of NIPPV (inspiratory positive airway pressure of 10 cm H₂O and expiratory positive airway pressure of 5 cm H₂O with FiO₂ of 1.0). These initial NIPPV settings are lower than ones used in a previous randomized controlled trial by Gray et al. (IPAP

14 ± 5 , expiratory 7 ± 3) [3]. Hence, the optimal settings which permit maintenance of SpO_2 greater than 88% need to be determined. Additionally, use of CPAP, which has been found to achieve similar improvements in respiratory distress and blood gases, is not considered in this study.

Finally, the outcome of this study was a composite of need for intubation and crossover to the alternative therapy at 72 h. This concerns us as crossover to alternative therapy is a subjective outcome in an unblinded study, which is subject to bias in favour of a newer therapy. More importantly, lack of therapy failure at 72 h might not be the most important goal in such patients. Any larger randomized trial addressing this key clinical question must address not only improvement in symptoms and restoration of oxygenation, but also improvement in short and long-term clinical outcomes including mortality.

Tejas Menon Suri, MD
Anant Mohan, PhD

Department of Pulmonary, Critical Care and Sleep Medicine, All India Institute of Medical Sciences, New Delhi, India

Antonio Esquinas, PhD
Intensive Care Unit, Hospital Morales Meseguer, Murcia, Spain

Vijay Hadda, MD
Department of Pulmonary, Critical Care and Sleep Medicine, All India Institute of Medical Sciences, New Delhi, India

Corresponding author at: Department of Pulmonary, Critical Care and Sleep Medicine, All India Institute of Medical Sciences, Ansari Nagar, New Delhi 110029, India.

E-mail address: vijayhadda@yahoo.com.

14 April 2019

<https://doi.org/10.1016/j.ajem.2019.05.019>

References

- [1] Haywood ST, Whittle JS, Volakis LI, Dungan G, Bublewicz M, Kearney J, et al. HVNI vs NIPPV in the treatment of acute decompensated heart failure: subgroup analysis of a multi-center trial in the ED. *Am J Emerg Med* Mar 3 2019 pii: S0735-6757(19)30151-2.
- [2] Rochwerg B, Brochard L, Elliott MW, Hess D, Hill NS, Nava S, et al. Official ERS/ATS clinical practice guidelines: noninvasive ventilation for acute respiratory failure. *Eur Respir J* 2017;50(2).
- [3] Gray A, Goodacre S, Newby DE, Masson M, Sampson F, Nicholl J, et al. Noninvasive ventilation in acute cardiogenic pulmonary edema. *N Engl J Med* Jul 10 2008;359(2):142–51.

Beyond NIPPV: HVNI Expands Potential Treatment Options For Acute Decompensated Heart Failure



Thank you for this observation. Patients were chosen for the inclusion of this trial because the treating physician felt that escalation to NIPPV would be the clinically appropriate next step in the patient's care. As to the safety and efficacy in heart failure, an important exclusion criterion in the study was known or suspected myocardial infarction, to help specifically address overwhelming cardiovascular compromise. This exclusion criterion also encompassed cardiogenic shock, or other forms of shock, which were excluded as hemodynamic instability. As with any study, there was also the ability for a clinician to exclude the patient from the study based on their best clinical judgement. NIPPV is currently the standard of care in patients with ADHF when conventional oxygen delivery is not sufficient [1]. Your point that NIPPV may be harmful in certain subsets of this patient population underscores the importance of identifying alternatives to NIPPV, such as HVNI, in

patients with ADHF. Patients were selected from an undifferentiated population presenting in the ED and represent a heterogeneous patient population [2]. These patients often had multiple pathologies, representative of a large proportion of patients seen in the ED. The authors recognize that this is a subgroup analysis resulting in interesting findings that suggest further study. We agree differentiation is an important goal - unfortunately this was a real-world study similar to what presents to the ED daily - undifferentiated patients. In subsequent trials in this population, further differentiating characterization will permit better 'success-phenotyping'.

The selection of pressure was initiated at 10 IPAP and 5 EPAP cmH_2O . However, the clinical instructions in the protocol were to titrate pressures to achieve the clinical effect (specifically, to reduce the respiratory rate to 'low 20's' and achieve tidal volumes of 6–8 ml/kg ideal body weight). Therefore, mean peak pressures applied to the patients during therapy in the NIPPV assigned arm of the trial was IPAP of 13 ± 3 cmH_2O and EPAP of 6 ± 1 cmH_2O . These pressures are consistent with the Gray trial [3]. It is important to also point out that the failure rate to intubation among the ADHF patients randomized to the NIPPV arm of the study (0%), especially when viewed through the prism of the APACHE II score (>30), may suggest adequate management of respiratory distress with the applied pressures.

We agree that the crossover endpoint was necessarily subjective for many patients. The authors point out the subjective character of these in the original study and ascribe this to less clinical familiarity with high-velocity nasal insufflation among this diverse population. As crossover was a requirement of the IRB primarily to minimize patient risk, we agree that given both these data, and the primary study outcomes, a future trial could plausibly be designed which would eliminate the requirement for a subjective 'crossover' of therapy - leaving a definitive intubation as the endpoint. The study truncated the duration for the primary outcome measurement (particularly intubation) at 72 h, reasoning that beyond 72 h such an outcome became more difficult to ascribe wholly to the acute therapy applied on admission - particularly in these complex patients. Further, neither the original study nor the subgroup analysis was powered to evaluate long-term mortality endpoints. These data could help inform the design of such a subsequent study in the adult ADHF patient population presenting in the ED.

Steven T. Haywood, MD*

Northeast Ohio Medical University, Rootstown, OH, USA

Summa Health System, Akron, OH, USA

Corresponding author at: 525 E Market St, 44304 Akron, USA.

E-mail address: steventhaywood@gmail.com.

Leonithas I. Volakis, PhD
Vapotherm, Inc, Exeter, NH, USA

Jessica S. Whittle, MD PhD
University of Tennessee, Chattanooga, TN, USA
The Erlanger Health System, Chattanooga, TN, USA

7 May 2019

<https://doi.org/10.1016/j.ajem.2019.05.021>

References

- [1] Marino PL. *Marino's the ICU book*. 4th ed. Lippincott Williams & Wilkins xv; 2014 [1059 pages].
- [2] Doshi P, et al. High-velocity nasal insufflation in the treatment of respiratory failure: a randomized clinical trial. *Ann Emerg Med* 2018;72(1):73–83 [e5].
- [3] Gray A, et al. Noninvasive ventilation in acute cardiogenic pulmonary edema. *N Engl J Med* 2008;359(2):142–51.