

Available online at www.sciencedirect.com

Resuscitation

journal homepage: www.elsevier.com/locate/resuscitation

Letter to the Editor

Reply to: “Tracheal intubation in patients with cardiac arrest: Should we focus on success rate of intubation rather than the outcome of resuscitation?”



We thank Sun et al. for pointing out the potential limitations of our study.¹ First, we acknowledge that the end-tidal carbon dioxide monitoring might have failed to confirm the successful tracheal intubation in some patients with cardiac arrest due to the several reasons (e.g., reduced pulmonary blood flow).² We also agree that the use of other modalities (e.g., point-of-care ultrasound) to confirm tube placement is important in this unique population. Nevertheless, all study investigators at the EDs followed the recommendations of the resuscitation guidelines and confirmed the successful tracheal tube placement not only by the end-tidal carbon dioxide monitoring but also by clinical assessment.³ Furthermore, it is unlikely that the probability of failed confirmation in the VL group systematically differed from that in the DL groups. Therefore, our causal inference should *not* have been confounded by this factor.

Second, the reasons for intubation attempt failure were multifactorial and complex. We note that the use of 24/7 independent observers to evaluate the specific reasons at each attempt is logistically challenging (or not feasible) in a prospective multicenter study setting. Yet, our data showed that oesophageal intubation – which incidence rate is similar to a previous study⁴ – is one of the potential reasons. Other potential factors include the use of a common (but stringent) definition of intubation attempt — i.e., as an insertion of the laryngoscope blade into the mouth, difficulty in intubating patients who actively undergo resuscitation, other patient factors (e.g., oral secretion, vomitus, blood), intubator factors (e.g., competency), or any combination of these factors.

Finally, as discussed in the article, our study did not have some clinically-helpful patient outcomes, such as time required to successfully perform intubation, chest compression interruption time, and return of spontaneous circulation (ROSC). However, the literature has documented that failed intubation attempts are one of the major risk factors not only for intubation-related adverse events but also for

decreased likelihoods of ROSC in patients with cardiac arrest.⁵ These relations are also clinically plausible. The existent evidence and our data collectively underscore the importance of first-pass success in the ED patients with cardiac arrest and suggest that its chance may be maximized with the use of VL, particularly in the less-experienced intubator.¹

Conflict of interest statement

The authors declare that there is no conflict of interest.

REFERENCES

1. Okamoto H, Goto T, Wong ZSY, et al. Comparison of video laryngoscopy versus direct laryngoscopy for intubation in emergency department patients with cardiac arrest: a multicentre study. *Resuscitation* 2018;136:70–7.
2. Sandroni C, De Santis P, D'Arrigo S. Capnography during cardiac arrest. *Resuscitation* 2018;132:73–7.
3. Link MS, Berkow LC, Kudenchuk PJ, et al. Part 7: adult advanced cardiovascular life support: 2015 American Heart Association guidelines update for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation* 2015;132:S444–64.
4. Kim JW, Park SO, Lee KR, et al. Video laryngoscopy vs. direct laryngoscopy: which should be chosen for endotracheal intubation during cardiopulmonary resuscitation? A prospective randomized controlled study of experienced intubators. *Resuscitation* 2016;105:196–202.
5. Kim J, Kim K, Kim T, et al. The clinical significance of a failed initial intubation attempt during emergency department resuscitation of out-of-hospital cardiac arrest patients. *Resuscitation* 2014;85:623–7.

Hiroshi Okamoto
*Graduate School of Public Health, St. Luke's International University,
Tokyo, Japan*

Tadahiro Goto*
*Graduate School of Medical Sciences, University of Fukui, Fukui,
Japan*

Kohei Hasegawa
Harvard Medical School, Boston, MA, USA

* Corresponding author at: Graduate School of Medical Sciences,
University of Fukui, 23-3 Shimoaizuki, Matsuoka, Eiheiji, Yoshida,
Fukui, 910-1193, Japan.
E-mail address: tadahirogoto@gmail.com (T. Goto).

<http://dx.doi.org/10.1016/j.resuscitation.2019.02.049>

© 2019 Elsevier B.V. All rights reserved.