American Journal of Emergency Medicine 69 (2023) 207–208

Contents lists available at ScienceDirect

American Journal of Emergency Medicine

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

Comparison of the bébé VieScope™ and direct laryngoscope for pediatric tongue oedema scenario: A simulation study

To the Editor,

Airway management is a crucial procedure for preserving life, especially in pediatric patients [1]. In unconscious patients, airway management failures may result in hypoxia, insufficient ventilation, and potential choking hazards [2]. Despite the progress made in ventilation techniques and airway management, endotracheal intubation continues to be the preferred method for children due to its ability to safeguard against regurgitation and facilitate mechanical ventilation. Despite its potential benefits, endotracheal intubation carries inherent risks. Complications may arise due to incorrect procedural methods, anatomical complexities, or insufficient equipment. Prolonged airway management procedures can lead to significant respiratory failure, exacerbating the child's medical state. The topic of discussion pertains to the potential impact of alternatives to direct laryngoscopes on the success rate of endotracheal intubation in pediatric patients [3]. Studies have demonstrated that novice medical practitioners exhibit superior outcomes when employing alternatives to direct laryngoscopes for endotracheal intubation [4]. Sustained training and experiential acquisition in both simulated and clinical environments are imperative for enhancing pediatric airway management.

The objective of our research was to assess the efficacy of intubation on the initial attempt, duration of intubation, subjective ease of intubation, Cormack-Lehane grade, and POGO score by utilizing the Vie Scope™ bébé laryngoscope (VieScope; Adroit Surgical LLC, Okl homa, OK, USA; Fig. 1) and MacIntosh blade laryngoscope (HEINE Optotechnik GmbH & Co. KG, Filching, Deutschland) for pediatric patients undergoing medical simulation in a tongue oedema scenario.

The study was conducted as a randomized crossover trial. The study was conducted in medical simulation settings and was approved by the Institutional Review Board of the Polish Society of Disaster Medicine. All participants provided voluntary, informed consent to participate in the study. The study is a continuation of work evaluating different types of laryngoscopes that the authors conducted on airway management in pediatric emergency medicine. Participants in the study were recruited from last year's paramedic students. The exclusion criteria included previous experience (simulation or clinical) with the use of the Vie Scope laryngoscopes in adults or children, and participants' wrist injuries. The study compared two types of laryngoscopes: the bébé VieScopeTM laryngoscope (VieScope) and the Macintosh laryngoscope with blade No. 2 (MAC). Before the study, all participants took part in a 60-min theoretical and practical training on airway management in pediatric patients in emergency medicine scenarios. During the training, the instructor demonstrated the correct procedure for endotracheal intubation using VieScope and MAC laryngoscopes. After the demonstration, all study participants had the option of a 10-min training session with each device under normal airway conditions. To perform a final study and simulate a pediatric patient, the Life/form® Advanced Child Airway Management Trainer (Nasco Healthcare, Fort Atkinson, WI 53538, USA) was used. The final part of the study was endotracheal intubation on this simulator with two different types of laryngoscopes in the tongue oedema scenario. The participants' order and intubation methods were randomized using the ResearchRandomizer program. In each scenario, participants had only one attempt to intubate with each type of laryngoscope. This improved the data's reliability and validity and enabled more relevant comparisons between those two types of laryngoscopes.

Twenty-seven last year paramedic students participated in our study. Intubation with VieScope, compared to intubation with MAC, was associated with a higher success rate of the first intubation attempt (92.3% vs. 63.0%, respectively; $p = 0.017$), better glottis visibility based on the Cormack-Lehane scale ($p < 0.001$; Supplementary Fig. 1) and better glottis visibility based on the POGO score (92% vs. 54%; $p < 0.001$). However, there was also an increase in intubation time using VieScope compared to MAC (45.5 s vs. 38.5; $p = 0.044$).

The findings of our study indicate that the bébé VieScope has the potential to serve as a valuable tool for endotracheal intubation in pediatric patients. Specifically, it was observed that the device yielded a superior initial success rate compared to a traditional laryngoscope when utilized by medical personnel who possess limited experience with intubation. This was particularly evident in instances where the patient exhibited tongue oedema. Additional research, specifically in the form of clinical trials, is required to establish a conclusive evaluation of this novel variant of laryngoscope for the purpose of endotracheal intubation in pediatric populations.

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ajem.2023.04.039.

Funding

Research Grant from Wroclaw Medical University, Wroclaw, Poland (SUBZ.E240.22.009).

CRediT authorship contribution statement

Pawel Wieczorek: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Writing – original draft, Writing – review & editing. **Michal Pruc:** Investigation, Writing – review & editing. **Maciej Krajsman:** Investigation, Writing – review & editing. **Wojciech Wieczorek:** Investigation, Writing – review & editing. **Basar Cander:** Methodology, Writing – review & editing. **Lukasz Szarpak:** Software, Supervision, Writing – original draft, Writing – review & editing. **Alla Navolokina:** Validation, Writing – review & editing. **Michal Matuszewski:** Investigation, Writing – review & editing. **Nicola Luigi Bragazzi:** Resources, Validation, Writing – review & editing. **Francesco Chirico:** Project administration, Writing – review & editing. **Jacek Smereka:** Investigation, Supervision, Writing – review & editing.

https://doi.org/10.1016/j.ajem.2023.04.039

Fig. 1. Intubation via bébé VieScope™ laryngoscope.

Declaration of Competing Interest

None.

References

[1] Hunyady A, Polaner D. Pediatric airway management education and training. Paediatr Anaesth. 2020 Mar;30(3):362–70. https://doi.org/10.1111/pan.13808.
[2] Szarpak L, Peacock FW, Rafique Z, et al. Comparison of vie scope® and Macintosh laryngoscopes for intubation during resuscitation by paramedics wearing personal protective equipment. Am J Emerg Med. 2022 Mar;53:122–6. https://doi.org/10.1016/j.ajem.2021.12.069.
[3] Wieczorek P, Szarpak L, Dabrowska A, et al. A comparison of the bébé VieScopeTM and direct laryngoscope for use while wearing PPE-AGP: a randomized crossover simulation trial. Children (Basel). 2022 Nov 18;9(11):1774. https://doi.org/10.3390/children9111774.
[4] Maslanka M, Smereka J, Czyzewski L, et al. VieScope® laryngoscope versus Macintosh laryngoscope during difficult intubation performed by paramedics: a randomized cross-over manikin trial. Disaster Emerg Med J. 2020;5(3):134–41. https://doi.org/10.5603/DEMJ.a2020.0031.

Pawel Wieczorek
Pediatric Intensive Care Unit (PICU), John Paul II Upper Silesian Health Centre in Katowice, Katowice, Poland
Research Unit, Polish Society of Disaster Medicine, Warsaw, Poland

Michal Pruc
Research Unit, Polish Society of Disaster Medicine, Warsaw, Poland
Department of Public Health, International Academy of Ecology and Medicine, Kyiv, Ukraine

Maciej Krajsman
Research Unit, Polish Society of Disaster Medicine, Warsaw, Poland
Department of Medical Informatics and Telemedicine, Medical University of Warsaw, Warsaw, Poland

Wojciech Wieczorek
Research Unit, Polish Society of Disaster Medicine, Warsaw, Poland
Department of Emergency Medicine, Medical University of Warsaw, Warsaw, Poland

Basar Cander
Department of Emergency Medicine, Bezmialem Vakif University, Fatih/Istanbul, Turkey

Lukasz Szarpak
Henry JN Taub Department of Emergency Medicine, Baylor College of Medicine Houston, Houston, TX, United States
Research Unit, Maria Sklodowska-Curie Bialystok Oncology Center, Bialystok, Poland
*Institute of Outcomes Research, Maria Sklodowska-Curie Medical Academy, Warsaw, Poland**
*Corresponding author at: Henry JN Taub Department of Emergency Medicine, Baylor College of Medicine Houston, Houston, TX, United States.
E-mail address: Lukasz.szarpak@gmail.com

Alla Navolokina
European School of Medicine, International European University, Kyiv, Ukraine

Michal Matuszewski
Department of Anaesthesiology and Intensive Therapy, Central Clinical Hospital of the Ministry of Interior and Administration, Warsaw, Poland

Nicola Luigi Bragazzi
Department of Mathematics and Statistics, Laboratory for Industrial and Applied Mathematics (LIAM), York University, Toronto, ON, Canada

Francesco Chirico
Health Service Department, Italian State Police, Ministry of the Interior, Milano, Italy

Jacek Smereka
Research Unit, Polish Society of Disaster Medicine, Warsaw, Poland
Department of Emergency Medical Service, Wroclaw Medical University, Wroclaw, Poland

23 April 2023