

Comparison of Airway Management in Two Urban Training Centres

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Abstract

Aims

To document and compare airway management practices in two teaching hospitals and to audit these findings against the Fourth National Audit Project (NAP4).

Methods

A two-week prospective audit was performed. All general anaesthetics administered in Mercy University Hospital (MUH) and South Infirmity Victoria University Hospital (SIVUH) were reviewed and the airway management documented. Type of surgery, airway device used, type of laryngoscope, adjuncts used, and any complications encountered during airway management were recorded.

Results

A similar number of general anaesthetics were administered in both centres during this time period. Intubation rates were higher than NAP4 due to the complexity of cases being performed in these surgical centres. In MUH, direct-laryngoscopy with a Macintosh laryngoscope was used for 88 (92% of cases), while in SIVUH video-laryngoscopy with a McGrath laryngoscope was used for 74 (79% of cases).

Discussion

As direct laryngoscopy slowly fades from the landscape of modern anaesthesiology, significant variation still exists between practices in different training hospitals.

Introduction

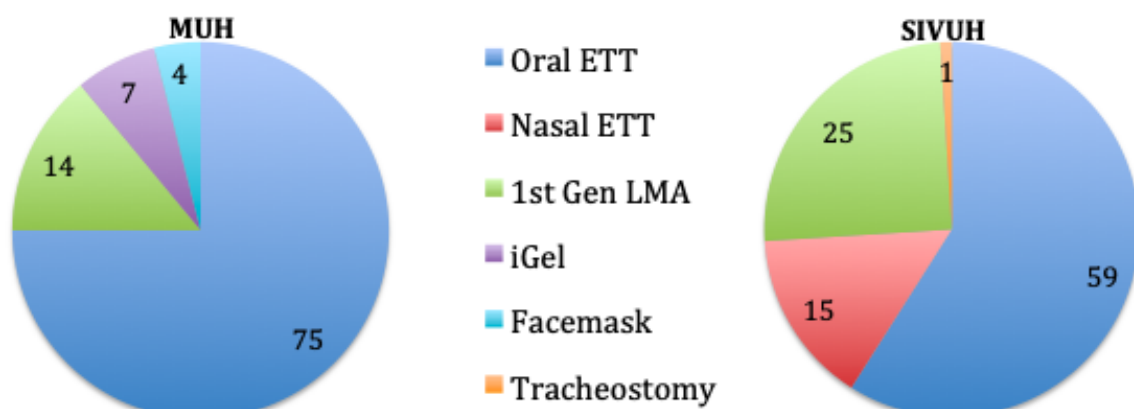
NAP4 was the largest study of major complications of airway management ever performed.¹ NAP4 surveyed anaesthetic departments in the UK over one year to identify the number of general anaesthetics performed, how the airway was managed, and any complications incurred. We audited airway management practice in two Cork teaching hospitals allowing comparison to NAP4 as well as each other. The hospitals audited were MUH and SIVUH. Both are urban surgical training centres affiliated with the College of Anaesthesiologists of Ireland (CAI).

Methods

A prospective audit was performed over the same two-week period in March 2022. All general anaesthetics administered in MUH and SIVUH for both elective and emergency surgeries were reviewed, and the airway management documented. The type of surgery, airway device used, type of laryngoscope and adjuncts used, and any complications encountered during airway management were recorded.

Results

Between the first and fifteenth of March, 128 general anaesthetics were administered in MUH and 127 general anaesthetics were administered in SIVUH. The relative proportions of type of airway device selected in the two centres are displayed in *Graph 1* below.



Graph 1: Percentage of each airway type used in MUH and SIVU.

Of the 96 intubations performed in MUH during this period, direct-laryngoscopy with a Macintosh laryngoscope was used for 88 (92% of cases) while video-laryngoscopy with a McGrath laryngoscope was used for 8 (8% of cases). By comparison, of the 94 intubations performed in SIVUH during this period, direct-laryngoscopy with a Macintosh laryngoscope was used for 19 (20% of cases), video-laryngoscopy with a McGrath laryngoscope was used for 74 (79% of cases) and a fibre-optic bronchoscope was used for intubation for one (1% of cases).

Incidence of complications was as follows: Difficult facemask ventilation (two-person technique or insertion of oropharyngeal airway): MUH 7, SIVUH 10; Change of airway-device required: MUH 3, SIVUH 5; Recognised oesophageal intubation: MUH 2, SIVUH 1; Aspiration: MUH 1, SIVUH 0; Difficult view (Cormack-Lehane² Grade \geq 3): MUH 7, SIVUH 4; Major airway complication: MUH 0, SIVUH 0. Major airway complication was defined as in NAP4 as death, hypoxic brain injury, emergency surgical airway or unanticipated ICU admission.¹

Discussion

There were higher rates of intubation than supraglottic-airway-devices when compared to NAP4 data, reflecting the complexity and nature of the surgeries being performed in these two centres. In MUH direct-laryngoscopy with the Macintosh laryngoscope was first-line for airway management. However, in SIVUH McGrath laryngoscopy was preferred for the majority of airways.

The preferred method of laryngoscopy has been a subject of much debate amongst anaesthetists in recent years.³⁻⁵ Many airway experts now advocate for video-laryngoscopy for all patients to avoid undiagnosed oesophageal intubation. It may also be considered a better training tool given the greater visibility for trainers to verify that the tube is correctly positioned and the shared learning available. A recent updated meta-analysis of video-laryngoscopy versus direct-laryngoscopy for adults undergoing tracheal intubation concluded that video-laryngoscopy was associated with fewer failed attempts and complications such as hypoxaemia, whereas glottic views were improved.⁶

Portable video-laryngoscopes have now found their place as essential on the difficult airway trolley in order to improve the glottic view and likelihood of successful tracheal intubation in the event of an unanticipated difficult airway, as referenced by the Difficult Airway Society Guidelines.⁷ This is particularly relevant in the emergency department and intensive care settings where non-anaesthetists are increasingly performing intubations in a less controlled environment with a potentially sicker cohort of patients.

All this points towards the undoubted conclusion that video-laryngoscopy is an important skill in the arsenal of any practicing anaesthetist. This is reflected in the 'Curriculum for the National Specialist Anaesthesiology Training Programme' recently released by the CAI.⁸ This document is designed with the principles of competency-based medical education in mind and describes a minimum volume of practice for video-laryngoscopy. However, it does not reference any specific requirement for the practice of direct-laryngoscopy. By contrast, in the UK the '2021 Curriculum for a CCT in Anaesthetics' released by the Royal College of Anaesthetists lists both direct and video-laryngoscopy as "procedural skills in which an anaesthetist in training must become proficient".⁹

There remains a body of opinion among a proportion of the anaesthetic community that direct-laryngoscopy remains an important core skill to which modern anaesthetic trainees have ever-reducing exposure and that video-laryngoscopy will not always be easily available in every centre or location for intubation. Training with video-laryngoscopy alone does not prepare trainees for this situation. The underexposure to this skill is a concern for many trainee anaesthetists. On a more global scale, it is also a concern that we are not training anaesthetists who are equipped with skills to work in lower-middle income countries, in resource-poor settings or to be involved in humanitarian projects.

So the question may now become not whether video-laryngoscopy is a superior or safer technique, but rather whether we must insist on the acquisition of direct-laryngoscopy as a core anaesthetic skill to be developed in tandem with video-laryngoscopy, and how to certify competence in this domain? Our study shows significant variation in practice currently exists in the use of direct and video-laryngoscopy across two different training centres.

Declaration of Conflicts of Interest:

All authors confirm that there are no conflicts of interest relating to this work.

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References:

1. Cook, T., N. Woodall, C. Frerk, and F.N.A. Project. Major complications of airway management in the UK: results of the Fourth National Audit Project of the Royal College of Anaesthetists and the Difficult Airway Society. Part 1: anaesthesia. *British journal of anaesthesia*. 2011;106(5):617-631.

2. Cormack, R. and J. Lehane. Difficult tracheal intubation in obstetrics. *Anaesthesia*. 1984;39(11):1105-1111.
3. Lewis, S.R., A.R. Butler, J. Parker, T.M. Cook, O.J. Schofield-Robinson, and A.F. Smith. Videolaryngoscopy versus direct laryngoscopy for adult patients requiring tracheal intubation: a Cochrane Systematic Review†. *BJA: British Journal of Anaesthesia*. 2017;119(3):369-383.
4. Kleine-Brüggeney, M., R. Greif, P. Schoettker, G.L. Savoldelli, S. Nabecker, and L. Theiler. Evaluation of six videolaryngoscopes in 720 patients with a simulated difficult airway: a multicentre randomized controlled trial. *BJA: British Journal of Anaesthesia*. 2016;116(5):670-679.
5. Zaouter, C., J. Calderon, and T. Hemmerling, *Videolaryngoscopy as a new standard of care*. 2015, Oxford University Press. p. 181-183.
6. Hansel, J., A.M. Rogers, S.R. Lewis, T.M. Cook, and A.F. Smith. Videolaryngoscopy versus direct laryngoscopy for adults undergoing tracheal intubation: a Cochrane systematic review and meta-analysis update. *British Journal of Anaesthesia*. 2022.
7. Frerk, C., V.S. Mitchell, A.F. McNarry, C. Mendonca, R. Bhagrath, A. Patel, et al. Difficult Airway Society 2015 guidelines for management of unanticipated difficult intubation in adults. *BJA: British Journal of Anaesthesia*. 2015;115(6):827-848.
8. Anaesthesia.ie. Curriculum for the National Specialist Anaesthesiology Training Programme: College of Anaesthesiologists of Ireland; 2020 [cited 2022 8 October]. [Pages 43-45]. Available from: <https://www.anaesthesia.ie/curriculum/?page=46>.
9. Rcoa.ac.uk. 2021 Curriculum for a CCT in Anaesthetics: Royal College of Anaesthetists; 2021 [cited 2022 8 October]. Version 1.0:[Page 170 Annex F - Practical Procedures grid]. Available from: [https://www.rcoa.ac.uk/sites/default/files/documents/2021-06/2021 Curriculum for a CCT in Anaesthetics v1.0.pdf](https://www.rcoa.ac.uk/sites/default/files/documents/2021-06/2021%20Curriculum%20for%20a%20CCT%20in%20Anaesthetics%20v1.0.pdf).