Retrospective cross sectional analysis of laryngoscope influence on intubation speed and attempts in general anaesthesia (GA) for Caesarean section

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1. Introduction

Induction of general anaesthesia for Caesarean delivery is often a stressful and time sensitive process. Pregnant patients are more likely to have a physiological or anatomically difficult airway, and there are frequently time pressures associated with the condition of the foetus and the desire to minimise the decision to delivery interval. A rapid sequence induction with placement of a cuffed ET tube is recognised to be the standard of care due to the high risk of aspiration in this population. The DREAMY study [1] has suggested that routine videolaryngoscopy may mitigate risk of difficult or failed intubation in obstetric patients and that the use of propofol and routine neuromuscular block monitoring may reduce the risk of awareness. We decided to examine airway management for GA Caesarean deliveries in our teaching hospital obstetric unit for the 2020-21 financial year to assess whether use of videolaryngoscopy (VL) affected the time taken or number of attempts required for successful intubation in obstetric patients having a Caesarean section.

2. Methods

With governance approval, we collected data retrospectively from our electronic health record, which captures real-time data on anaesthetic events and monitoring. Patients having Caesarean surgery under general anaesthesia between April 2020 and March 2021 were identified via a search query to find all patients having Caesarean delivery who received a dose of induction agent or who had an airway intervention documented.

Data was gathered about basic patient and operative characteristics including body mass index, urgency and time of day of procedure, grade of most senior anaesthetist present, which induction agent and muscle relaxant were used, the time taken from induction to successful placement of an ET tube, and number of attempts required.

Data was gathered via manual review of the electronic anaesthetic record. Where an induction time was not recorded the time of administration of induction agents was used as a substitute.

We used non-parametric tests to compare distributions between groups with use of videolaryngoscopy or direct laryngoscopy.

3. Results

71 GA Sections in 2020-21 (3.3% GA rate)

58 Anaesthetic records complete and reviewed **39** uses of VL (67%)

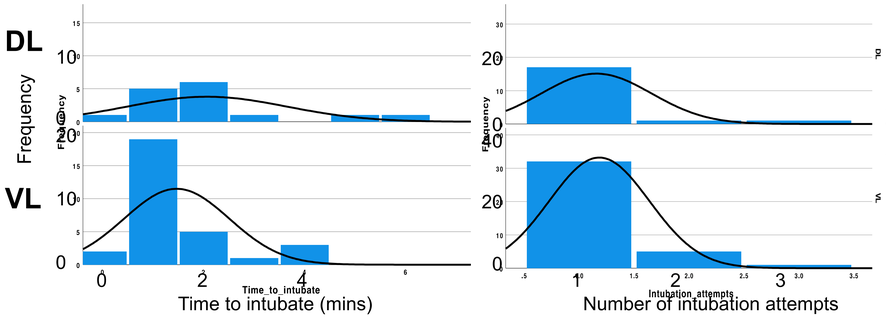
NO SIGNIFICANT DIFFERENCE in time to intubation or number of attempts

4 patients (10%) had change of technique from VL to DL **ONE FAILED INTUBATION** (in VL group)

No significant difference in BMI across groups

Nearly all patients received propofol and rocuronium

VL used more in non-urgent procedures and by non consultants



	DL	VL
Number	19	39
Median Time to Intubation (min)	2 [1-2] (p=0.172)	1 [1-2]
Median Intubation Attempts	1 [1-2]	1 [1-2]
Category 1 use	8 (42%)	10 (26%)
Consultant led use	16 (84%)	27 (69%)
Usage In Hours	13 (68%)	24 (62%)
Rocuronium use	19 (100%)	39 (100%)
Propofol use	17 (89%)	38 (97%)

Fig 1 (above): Histograms of time from induction to intubation and number of intubation attempts for videolaryngoscopy (VL) and direct laryngoscopy (DL)

Fig 2 (left): Summary table of results P values for time to intubation and intubation attempts are 0.172 and 0.633 respectively

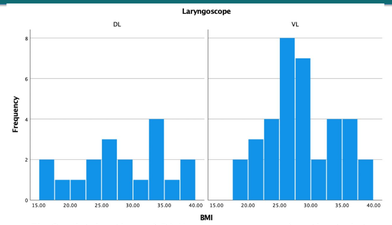


Fig 2: distribution of BMI across groups of patients intubated with direct or video laryngoscopy

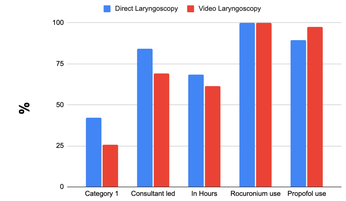


Fig 3: Comparison of proportions of patients in DL and VL groups who had (a) Cat 1 (b) Consultant led anaesthetic (c) a procedure in hours, and (d/e) rocuronium and/or propofol

4. Discussion

Of note is that the only failed intubation in our data set was of a patient who underwent videolaryngoscopy, and 4 patients had a change in technique from VL to direct laryngoscopy. No complications were caused by the airway management. No patient had a change in technique from direct to video laryngoscopy – potentially because direct laryngoscopy is chosen for patients who are perceived to be more straight forward. We were also pleased to find that the majority of patients received propofol as an induction agent which should reduce risk of awareness. A significant operational concern is that 20% of patients in our unit who underwent general anaesthesia for Caesarean did not have a complete airway record. For units that use an EPR it is an important reminder to make recording of airway management robust and easily accessible, especially in a time critical and stressful situation.

Although a small data set limits our conclusions we clearly show that our local use of videolaryngoscopy in obstetric GA has increased since the DREAMY study where national use was only 1.9%. Although we show no statistically significant change in number of attempts or time to intubate using VL, it appears non-inferior to DL in this population, so does not appear to cause harm. VL is generally recognised to be beneficial in a difficult airway [2] and as it does not appear to extend intubation time this may support routine use in obstetrics.

References

1. Odor P M, Bampoe S, Moonesinghe S R et al. General anaesthetic and airway management practice for obstetric surgery in England: a prospective, multicentre observational study. Anaesthesia. 2021;76(4):460-471
2. Howle R, Onwochei D, Harrison S et al. Comparison of videolaryngoscopy and direct laryngoscopy for tracheal intubation in obstetrics: a mixed-methods systematic review and meta-analysis. Canadian Journal of Anaesthesia. 2021;68(4):546-565