



Cochrane
Library

Cochrane Database of Systematic Reviews

Videolaryngoscopy versus direct laryngoscopy for tracheal intubation in neonates (Review)

Lingappan K, Arnold JL, Fernandes CJ, Pammi M

Lingappan K, Arnold JL, Fernandes CJ, Pammi M.
Videolaryngoscopy versus direct laryngoscopy for tracheal intubation in neonates.
Cochrane Database of Systematic Reviews 2018, Issue 6. Art. No.: CD009975.
DOI: [10.1002/14651858.CD009975.pub3](https://doi.org/10.1002/14651858.CD009975.pub3).

www.cochranelibrary.com

[Intervention Review]

Videolaryngoscopy versus direct laryngoscopy for tracheal intubation in neonates

Krithika Lingappan¹, Jennifer L Arnold¹, Caraciolo J Fernandes¹, Mohan Pammi¹

¹Section of Neonatology, Department of Pediatrics, Baylor College of Medicine, Houston, TX, USA

Contact address: Mohan Pammi, Section of Neonatology, Department of Pediatrics, Baylor College of Medicine, 6621 Fannin Street (WT 6-104), Houston, TX, 77030, USA. mohanv@bcm.tmc.edu, sujamohan97@sbcglobal.net.

Editorial group: Cochrane Neonatal Group.

Publication status and date: New search for studies and content updated (conclusions changed), comment added to review, published in Issue 6, 2018.

Citation: Lingappan K, Arnold JL, Fernandes CJ, Pammi M. Videolaryngoscopy versus direct laryngoscopy for tracheal intubation in neonates. *Cochrane Database of Systematic Reviews* 2018, Issue 6. Art. No.: CD009975. DOI: [10.1002/14651858.CD009975.pub3](https://doi.org/10.1002/14651858.CD009975.pub3).

Copyright © 2018 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.

ABSTRACT

Background

Establishment of a secure airway is a critical part of neonatal resuscitation in the delivery room and the neonatal unit. Videolaryngoscopy has the potential to facilitate successful endotracheal intubation and decrease adverse consequences of delay in airway stabilization. Videolaryngoscopy may enhance visualization of the glottis and intubation success in neonates.

Objectives

To determine the efficacy and safety of videolaryngoscopy compared to direct laryngoscopy in decreasing the time and attempts required for endotracheal intubation and increasing the success rate at first intubation in neonates.

Search methods

We used the search strategy of Cochrane Neonatal. In May 2017, we searched for randomized controlled trials (RCT) evaluating videolaryngoscopy for neonatal endotracheal intubation in Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, Embase, CINAHL, abstracts of the Pediatric Academic Societies, websites for registered trials at www.clinicaltrials.gov and www.controlled-trials.com, and reference lists of relevant studies.

Selection criteria

RCTs or quasi-RCTs in neonates evaluating videolaryngoscopy for endotracheal intubation compared with direct laryngoscopy.

Data collection and analysis

Review authors performed data collection and analysis as recommended by Cochrane Neonatal. Two review authors independently assessed studies identified by the search strategy for inclusion.

We used the GRADE approach to assess the quality of evidence.

Main results

The search yielded 7057 references of which we identified three RCTs for inclusion, four ongoing trials and one study awaiting classification. All three included RCTs compared videolaryngoscopy with direct laryngoscopy during intubation attempts by trainees.

Time to intubation was similar between videolaryngoscopy and direct laryngoscopy (mean difference (MD) -0.62, 95% confidence interval (CI) -6.50 to 5.26; 2 studies; 311 intubations) (very low quality evidence). Videolaryngoscopy did not decrease the number of intubation

attempts (MD -0.05, 95% CI -0.18 to 0.07; 2 studies; 427 intubations) (very low quality evidence). Moderate quality evidence suggested that videolaryngoscopy increased the success of intubation at first attempt (typical risk ratio (RR) 1.44, 95% CI 1.20 to 1.73; typical risk difference (RD) 0.19, 95% CI 0.10 to 0.28; number needed to treat for an additional beneficial outcome (NNTB) 5, 95% CI 4 to 10; 3 studies; 467 intubation attempts).

Desaturation episodes during intubation attempts were similar between videolaryngoscopy and direct laryngoscopy (MD -0.76, 95% CI -5.74 to 4.23; 2 studies; 359 intubations) (low quality evidence). There was no difference in the incidence of airway trauma due to intubation attempts (RR 0.10, 95% CI 0.01 to 1.80; RD -0.04, 95% CI -0.09 to -0.00; 1 study; 213 intubations) (low quality evidence).

There were no data available on other adverse effects of videolaryngoscopy.

Authors' conclusions

Moderate to very low quality evidence suggests that videolaryngoscopy increases the success of intubation in the first attempt but does not decrease the time to intubation or the number of attempts for intubation. However, these studies were conducted with trainees performing the intubations and these results highlight the potential usefulness of the videolaryngoscopy as a teaching tool. Well-designed, adequately powered RCTs are necessary to confirm efficacy and address safety and cost-effectiveness of videolaryngoscopy for endotracheal intubation in neonates by trainees and those proficient in direct laryngoscopy.

PLAIN LANGUAGE SUMMARY

The use of video devices in assisting the placement of breathing tube in babies

Review question

Does placement of a breathing tube (intubation) using a video-assisted device (videolaryngoscope) increase the success and safety of the procedure in newborn babies compared to the standard approach of looking at the opening of the airway (vocal cords) without video assistance (direct laryngoscopy)?

Background

One in 100 newborn babies may need intubation to sustain life when they have difficulty breathing. The placement of a breathing tube using direct laryngoscopy may be challenging in newborns. When teaching this life-saving skill to trainees, supervisors rely mainly on the feedback from the trainee (junior colleague) rather than by visual confirmation. It is difficult for the supervisor to provide real-time feedback to the trainee in this situation. Videolaryngoscopy may make this procedure easier and safer than the direct laryngoscopy approach. We wanted to discover whether using the videolaryngoscope increased the success and safety of the intubation procedure in newborns compared to the direct laryngoscopy technique.

Study characteristics

We sought evidence for the usefulness of these video-assisted devices for the placement of breathing tubes in babies. We searched scientific databases for clinical trials of babies who needed intubation in the delivery room, operating room or intensive care unit. The studies could measure time to intubation, number of attempts at intubation, success rate of first intubation or side effects. The evidence is current to May 2017. We included three studies, which provided data on up to 467 intubation attempts in newborns by trainees.

Key results and quality of the evidence

Data from three included studies suggest that videolaryngoscopy increases the success of intubation at first attempt but does not decrease the time to intubation, the number of attempts or side effects due to placement of the breathing tube. These studies were done with trainees and highlights the use of videolaryngoscopy as a teaching tool. We make a case for further research in evaluating the use of video-assisted devices in the placement of breathing tubes in newborns.