

Comparison of single-use and reusable metal laryngoscope blades for orotracheal intubation during rapid sequence induction (RSI) of anesthesia: a multicenter cluster randomized study

In this study, single-use metal laryngoscope blades were associated with higher tracheal intubation success rates during RSI compared with reusable metal laryngoscope blades

In the emergency setting, single-use metal laryngoscope blades have the potential to resolve concerns around infection, efficiency, and costs associated with reusable laryngoscope blades

Objective

- To test the hypothesis that the performance of a Macintosh metal single-use laryngoscope blade was not inferior to a Macintosh metal reusable laryngoscope blade in adult patients requiring rapid sequence induction of anesthesia

Methods

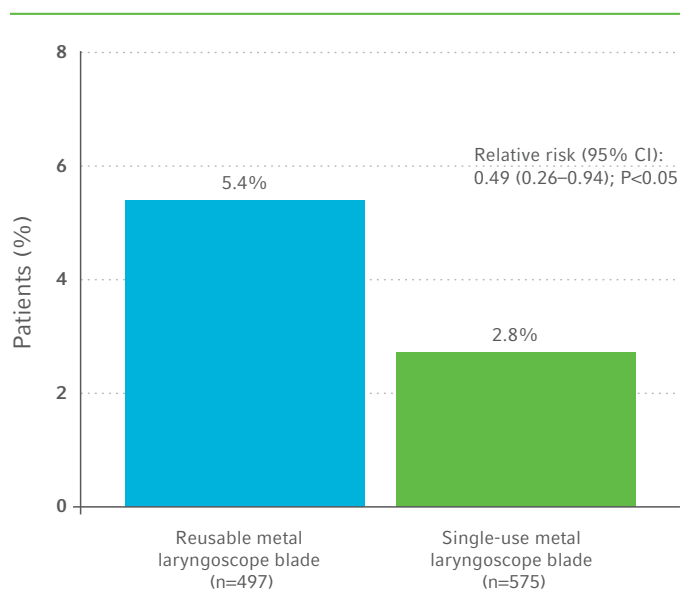
- This was a multicenter cluster randomized study in which 1072 adult patients requiring emergency intubation under rapid sequence induction of anesthesia were randomly assigned on a weekly basis to be managed with either a single-use or reusable Macintosh laryngoscope blade
 - The same type of blade was used for seven consecutive days
- Patients were pre-oxygenated with 100% oxygen for 4 minutes or until the end-tidal expiratory oxygen concentration was at least 90% and anesthesia was initiated with 5 mg/kg thiopental or 0.4 mg/kg etomidate, followed by neuromuscular blockade with 1 mg/kg succinylcholine
- Tracheal intubation was performed with a size 4 laryngoscope blade, a 7.5 mm ID endotracheal tube with internal stylet, and cricoid pressure
 - Failure to intubate the trachea within 60 seconds of induction was considered a failed intubation

- In the event of a failed intubation, a second tracheal intubation could be attempted with the opposite type of blade
- The main outcome of interest during the study was failure to intubate the trachea within 60 seconds of induction of anesthesia
 - Cormack and Lehane score, duration of intubation, complication rates, and device illuminance were also measured

Results

- In total, 497 (46%) patients were managed with reusable metal blades and 575 patients (54%) were managed using single-use metal blades
 - Patient characteristics, including risk factors for difficult intubation, were similar between the groups
- A significantly lower intubation failure rate was observed with single-use metal blades versus reusable metal blades (2.8 vs. 5.4%, respectively; $P < 0.05$; Figure 1)

Figure 1. Rates of failed intubation at the first attempt with reusable metal or single-use metal laryngoscope blades



- The duration of intubation was similar between groups
- The proportion of grade III and IV Cormack and Lehane scores was significantly decreased with single-use metal blades compared with reusable metal blades (6 vs 10%, $P < 0.05$)
- A trend for a lower rate of global complications occurring with single-use metal blades was observed, but the difference did not reach significance (6.8 vs. 11.4%, respectively; $P =$ not significant)
- The mean illuminance provided by the reusable metal blades was significantly greater than that provided by the single-use metal blades; however, the variation (determined by the standard deviation) and the proportion of reusable metal blades providing a low illuminance (< 40 lux) was noticeably greater versus single-use metal blades
- In an opinion survey performed among 80 investigators, most (71/80, 89%) considered single-use metal blades to be 'better' or 'equivalent' to reusable metal blades
 - Of the 27 investigators who considered single-use metal blades to be superior to reusable metal blades, 22 (81%) cited the light provided as the main reason for this

Conclusion

- Single-use metal laryngoscope blades were associated with fewer poor grade laryngeal views and fewer failed first attempts than reusable metal laryngoscope blades in patients requiring emergency intubation under rapid sequence induction