

Comparison of Laryngeal Mask Airway (LMA) and Endotracheal Tube (ETT) Placement in Neonates

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Background and Objective

With increased use of non-invasive ventilation, there has been an increased focus of research on less invasive methods of delivering surfactant to neonates with respiratory distress syndrome. We investigated the use of a laryngeal mask airway (LMA) for surfactant administration for infants requiring continuous positive airway pressure (CPAP). Infants who met treatment failure criteria in the LMA and Control groups were intubated and given surfactant via an endotracheal tube (ETT).

This study compares placement of an LMA to placement of an ETT in neonates.

Methods

This is part of a multicenter, randomized controlled trial.

Eligibility Criteria:

- 28 – 36 weeks
- Weight ≥ 1250g
- Age ≤ 36 hours old
- On nCPAP with FiO₂ 30-40%
- CXR and clinical signs of RDS

Infants were randomized into:

LMA Group: surfactant given via an LMA, placed back on CPAP

Control Group: remained on CPAP, no surfactant given

Intubation criteria was the same for both groups

Videotape of LMA (n=36) and ETT (n=31) placement were reviewed to determine the time and number of attempts required for successful placement. Heart rate (HR) and oxygen saturation (SaO₂) change from baseline were analyzed as measures of physiologic stability during placement.

Results: Subject Characteristics

	LMA (n=36)	ETT (n=31)
Birth Weight, mean ±SD (range), g	2007 ± 483 (1290 - 3180)	2059 ± 531 (1254 - 3305)
Gestational age, mean ± SD (range), wks	32 6/7 ± 1 5/7 (29 3/7 - 35 4/7)	32 4/7 ± 1 6/7 (28 5/7 - 35 6/7)

Results: Time and Number of Attempts

	LMA (n=36)	ETT (n=31)	p-value
Duration of Attempt, mean ±SD (range), sec median	32 ± 19 (21 - 81) 28	66 ± 48 (12 - 171) 45	< .001
Procedure time, mean ± SD (range), sec median	88 ± 136 (12-500) 30	153 ± 180 (12-627) 49	0.065
Successful < 35 sec < 45 sec < 60 sec	64% 72% 75%	61% 76% 92%	
Number of attempts, mean	1.5	1.9	0.106
Successful 1 attempt 2 or more	69% 83%	58% 68%	

Results: Physiologic Stability

	LMA n=36	ETT n=31	p-value
Heart Rate, mean ±SD (range), bpm median	1 ± 5 (-9-11) 1	-1 ± 8 (-20-16) 1	0.333
SaO ₂ , mean ±SD (range), % median	-7 ± 7 (-24-1) -3	-4 ± 11 (-23-20) -2	0.361

Summary and Conclusion

Duration of attempts was shorter for LMA compared to ETT placement (32 sec vs 66 sec, p<0.001). Mean total procedure time for successful LMA placement was 88 sec compared to 153 sec for ETT (p=0.065). Mean number of attempts for successful placement was fewer for LMA placement (1.5 vs 1.9, p=0.106). Physiologic parameters remained near baseline in LMA and ETT groups with HR change +1 bpm and -1 bpm (p=0.333) and SaO₂ change -7% and -4% (p=0.361).

Placement of an LMA is well tolerated and required **less time** and **fewer number of attempts** as compared to the traditional method of endotracheal intubation.

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