A comparison of McGrath MAC videolaryngoscopy and Macintosh laryngoscopy in children

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Background

Difficulties in airway management, particularly during tracheal intubation, are associated with significant morbidity and mortality. The McGrath videolaryngoscope offers a better view of laryngeal inlet compared to a Macintosh laryngoscope in adult, and increases success rate of orotracheal intubation in patients with difficult airways.

This was performed to evaluate the usefulness of the McGrath videolaryngoscope compared to Macintosh laryngoscopy in pediatric patients during routine orotracheal intubation, by comparing the time to intubation and ease of intubation

Methods

- Prospective randomized controlled study
- 84 pediatric patients aged 1-10 years with an ASA physical status I-II undergoing orotracheal intubation for elective surgery
- Randomization into two groups:
McGrath group (n = 42), **Macintosh** group (n = 42)
- Anesthesia: induced with propofol & sevoflurane orotracheal intubation 2 min after rocuronium 0.6 mg/kg
- Primary outcome: time to intubation
- Secondary outcome: Cormack and Lehane glottic grade, Intubation difficulty score (IDS)
- Hemodynamic changes: at baseline, 1 min after induction, before and 1 min after intubation

Results

Table 1. Patient characteristics and airway assessment measurements

	McGrath (n = 42)	Macintosh (n = 42)	p value
Age (yr)	6 ± 2	6 ± 2	0.346
Height (cm)	116.6 ± 14.3	113.6 ± 11.8	0.293
Weight (kg)	22.9 ± 7.3	20.9 ± 4.9	0.151
Body mass index (kg/m ²)	16.20 [14.87–17.82]	16.24 [14.79–17.22]	0.552
Sex (male/female)	23/19	22/20	0.827
ASA physical status (I/II)	39/3	40/2	>0.999
Mallampati class (1/2/3/4)	22/11/0/0	25/12/0/0	0.936
Neck mobility			>0.999
normal	42 (100%)	41 (98%)	
reduced	0	1 (2%)	
fixed flexion	0	0	
Upper incisors (normal/ abnormal)	37/5	38/4	>0.999

Mean ± SD, median [interquartile range] or number (proportion).
BMI, body mass index; ASA, American Society of Anesthesiologists.

Table 2. Outcomes

	McGrath (n = 42)	Macintosh (n = 42)	p value
Failure of intubation	1 (2%)	1 (2%)	>0.999
Time to intubation (sec)	25 [23–28]	26 [24–29]	0.301
Cormack and Lehane grade			0.007
1	40 (95%)	31 (74%)	
2	2 (5%)	11 (26%)	
OELM	3 (7%)	10 (24%)	0.035
Lifting force	3 (7%)	9 (21%)	0.061
IDS	0 [0-0]	0 [0-1]	0.018

Mean ± SD, median [interquartile range] or number (proportion).

OELM, optimal external laryngeal manipulation; IDS, intubation difficulty scale.

- Intubation difficulty score (IDS)

Variables	Scores
Number of attempts at intubation	n-1
Number of operators attempting intubation	n-1
Number of alternative intubation techniques used	n-1
Cormack and Lehane grade of laryngoscopy (1/2/3/4)	Grade-1
Increased lifting pressure required	1
External pressure applied on larynx	1
Mobile vocal cords	1

Intubation difficulty score=Sum of score of seven variables; IDS=0 (Easy intubation); IDS=1-5 (Moderately difficult intubation); IDS=5-15 (Very difficult to impossible intubation)

Fig 1. The mean arterial pressure and heart rate.

Mean ± SD.

T0, at baseline; T1, 1 min after induction; T2, before intubation; T3 1 min after intubation

Conclusions

The McGrath videolaryngoscope provided better laryngoscopic views and lower IDS, but similar intubation time compared to Macintosh laryngoscope in pediatric patients who underwent orotracheal intubation.