Similar efficacy of Ambu Laryngeal Mask® and LMA Unique® during anaesthesia in children less than 30 kg

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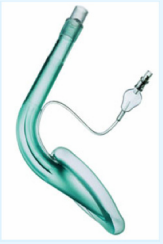
Background

The use of laryngeal masks in children has increased during the last decade and therefore there are demands for safe and reliable disposable products.

LMA Unique®



Ambu Laryngeal Mask®

Aim

In order to compare the efficacy of the Ambu Laryngeal Mask® (Ambu) with the LMA Unique® (Unique), we aimed to investigate non-paralysed infants/children with a weight of less than 30 kg in terms of insertion time in first attempt, insertion success rates, efficacy of seal, adequate positioning and intra- and postoperative complications.

Table 1

	AMBU LM (n = 32)	LMA Unique (n = 27)
	% or mean (SD)	
Male (n)	76.9%	78.3%
Female (n)	23.1%	21.7%
Age (y)	3.0 (2.6)	2.6 (2.3)
Weight (kg)	14.0 (6.8)	13.0 (5.8)
Premedication	11.5%	8.7%
Analgesic before LM	80.8%	91.3%
Sevoflurane before LM	38.5%	39.1%
Size of mask # 1	15.5%	8.8%
Size of mask # 1½	11.5%	30.4%
Size of mask # 2	53.8%	39.1%
Size of mask # 2½	19.2%	21.7%

No significant difference between the groups

Materials and Methods

Patients (n = 59) were randomized and included in the study. Thirty two patients (54%) were randomized to Ambu and 27 patients (46%) to Unique. For patient characteristics refer to Table 1. A randomized, single-blinded, multi-centre, international study design was used, including children scheduled to undergo elective short surgical/anaesthetic procedures. The size of the mask was determined by the weight of the child according to manufacturers recommendations. Insertion time was from picking up the laryngeal mask to first recording of expiratory carbon dioxide. A failed attempt was defined as removal of the device from the mouth. The intra cuff pressure was measured and adjusted to 60 cm H_2O where after oropharyngeal leak pressure was determined. Final position of the laryngeal mask was determined fiber optically.

Results

Insertion time at first attempt (mean±SD) was 12.9±5.0 sec vs. 17.4±6.2 sec (Ambu vs. Unique) (p = 0.004, Figure 1). All 32 Ambu were inserted in first attempt, whereas 6 (22%) of the Unique required a second insertion attempt (p = 0.005). Vocal cords were fiber optically visualized in 93.7% of the patients in the Ambu group and in 66.7% in the Unique group (Figure 2) (p < 0.05). On a scale from 1 (vocal cords not seen) to 4 (only vocal cords seen) the mean score was 3.0 vs. 2.2 (p = 0.004, Mann-Whitney t-test). End-tidal CO_2 after laryngeal mask placement was 5.2±0.8 kPa (Ambu) vs. 5.9±1.0 kPa (Unique) (p = 0.01, Student t-test). No significant differences was found regarding oropharyngeal leak, leak over stomach and per- or postoperative complications.

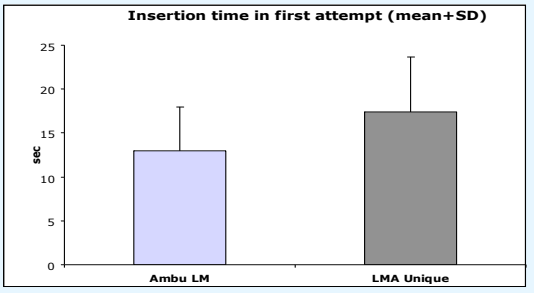


Figure 1

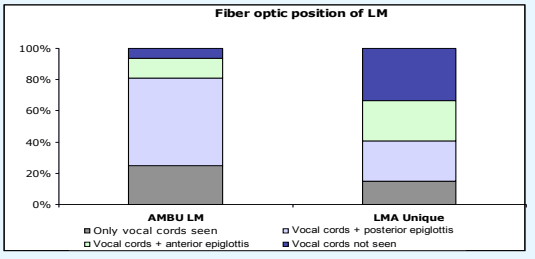


Figure 2

Discussion

Mean insertion time for the LMA Unique® at first attempt was 34% longer than the Ambu LM®, furthermore, 22% of the patients required a second insertion to obtain adequate position. However, for the majority the difference of 5 sec in insertion time is without significant clinical importance. On the other hand, more than one insertion of a laryngeal masks could potentially be harmful, resulting in laryngospasms, coughing, edema and injury to the oropharyngeal region. No differences in complications were seen when comparing the two masks. Together both masks provided adequate ventilation with few side effects. The designs of the masks may account for the significant differences when position of the mask in relation to the trachea was assessed fiber optically. Although, the vocal cords (trachea) were not visible in 6% (Ambu) and 33% (Unique) of the patients, it did not seem to influence the efficacy of the seal, nor the ventilation.

Conclusion

Significantly shorter insertion time, more successful insertion and better positioning was seen with the Ambu Laryngeal Mask®. However, the clinical relevance of these differences when comparing Ambu Laryngeal Mask® to LMA Unique® is limited. Therefore, personal preferences and price remain the most important factors when choosing between the two.

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