AMBU LARYNGEAL MASK VS. LARYNGEAL MASK UNIQUE: EVALUATION OF TWO MODIFIED DISPOSIBLE VENTILATORY DEVICES

H. Francksen, M.D., B. Bein, M.D., T. Obermöller, B.S., J. Scholz, M.D., V. Dörges, M.D.

Department of Anaesthesiology and Intensive Care Medicine
University Hospital Schleswig-Holstein, Campus Kiel, Germany

Purpose of the study:

Re-usable supraglottic airway devices are established in clinical anesthesia and were previously shown to be safe and efficient (1-3). Especially for emergency airway management there was increasing demand for disposable devices. The purpose of the present prospective, randomized, controlled trial was to assess the recently developed Laryngeal Mask Unique (LMA-U) and the Ambu® Laryngeal Mask (Ambu LM) in routine clinical practice.

Materials and methods:

After approval of our IRB and written informed consent was obtained in 80 patients (ASA 1-3), undergoing minor routine gynecologic surgery, standardized anesthesia was induced (Remifentanil, 5 µg/kg/min; Propofol, 2 mg/kg). Patients were randomly allocated to controlled ventilation (FiO_2, 0.4; VT, 7 ml/kg; respiratory rate, 10 min^{-1}) with the LMA-U (n=40) or Ambu LM (n=40). Both devices were inserted by a single experienced anesthesiologist; cuff inflation was performed with 20 ml of air in both devices, as recommended by the manufacturers. SpO_2 was recorded before induction of anaesthesia, and after pre-oxygenation. After five and 10 minutes of ventilation with the LMA-U or Ambu LM, SpO_2, $etCO_2$, VT_{ex} and Paw were recorded. Capillary blood gas samples were taken before induction of anesthesia, and after 10 minutes of ventilation. Time of insertion, failure rate and airway leak pressure were measured. Occurrence of gastric inflation was assessed with a stethoscope placed on the epigastrium. Patients were asked about sore-throat, dysphonia, and dysphagia 24 hours after surgery (post-operative airway morbidity).

Figure 1: Ambu LM and Laryngeal Mask Unique (LMA-U)

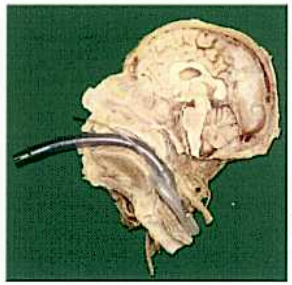

Figure 2: Supraglotic airway devises Laryngeal Mask Unique

	Time of insertion (sec)	Failures	PAW (cmH_2O)	Cuff pressure (cmH_2O)	ALP (cmH_2O)
LMA-U	22 (8-57)	0/40	14 (6-20)	65 (20-130)	16 (5-28)
Ambu LM	16 (8-35)	1 / 40	14 (9-23)	60 (15-140)	18 (12-38)

Table 1. Insertion time, failure rate, peak airway pressure , cuff pressure, and airway leak pressure with the Laryngeal Mask Unique(LMA-U) and the Ambu LM.

	Before induction		After 10 min. of ventilation	
	LMA-U	Ambu LM	LMA-U	Ambu LM
pH	7,45 ± .03	7,46 ± .03	7,45 ± .04	7,45 ± .03
$PaCO_2$ (mmHg)	38 ± 3	38 ± 3	40 ± 6	42 ± 5
PaO_2 (mmHg)	80 ± 11	81± 10	183 ± 73	148± 37

Table 2. Arterial blood gas samples before induction of anesthesia, and after 10 min. of ventilation with Laryngeal Mask Unique (LMA-U) and the Ambu LM

Results:

There were no differences in demographic data between groups at baseline. Time of insertion and failure rate was comparable with the LMA-U and Ambu LM (median: 22 sec; range, 8-57 sec. vs. 16 sec; 8-35 sec; *P* = ns; Failures; LMA-U 0/40 vs. Ambu LM 1/40). Blood gas samples and ventilation variables revealed sufficient ventilation and oxygenation with either device. Paw (LMA-U: median 14 cm H_2O; range 6-20 cm H_2O; Ambu LM: 14; 9-23) was comparable and airway leak pressure (LMA-U: median, 16 cm H_2O; range, 5 to 28 cm H_2O vs. Ambu LM: 18, 12 to 38) was higher (P=ns) with the Ambu LM compared to the LMA-U. Post-operative airway morbidity was comparable with the LMA-U and with the Ambu LM. No gastric inflation occurred with either device.

Conclusions:

Employing the LMA-U and Ambu LM resulted in comparable ventilation and oxygenation variables. Both newly developed disposable devices may be simple alternatives to secure the airway in routine minor surgical proceders.

References:

(1) Anesth Analg 2003;96:1214-7.
(2) Anesthesiology 2003;99:1066-71.
(3) Br J Anaesth 1999;82:286-7.

Contact: www. uni-kiel.de/anaesthesie/
francksen@anaesthesie.uni-kiel.de