LMA-Unique, SoftSeal, LaryVent, LTD: bench model comparison of 4 single-use supraglottic devices with facemask ventilation

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Background and Goal of Study: Different supraglottic single-use airway devices have been introduced in recent years for ventilation during elective surgical procedures. Main argument to refrain from using reusable devices is the possible transmission of infections via improperly sterilized masks and tubes (1,2). In a bench model, ventilation with LMA-Unique (LMA Company), SoftSeal (Smiths), LTD (VBM Medical) and LaryVent (B+P) is compared to facemask ventilation.
Materials and Methods: For all devices, standardised 3-minute ventilation cycles (IPPV, tidal volume 750 ml, respiratory rate 12/min) were performed with a Draeger Oxylog 3000 (Draeger medical). In a bench model consisting of a Ambu Megacode Station connected to a PC (Megacode software 2.23), 10 cycles each were performed with facemask, LMA-Unique, SoftSeal, LTD (all size 4) and LaryVent (size 9.0). Tidal volumes and peak airway pressures were measured with cuff pressures adjusted to 80 cm H_2O. Data were compared using the t-test.
Results and Discussions: Ventilation was possible with all airway devices without signs of gastric insufflation.

	Tidal volume	Peak airway pressure
Facemask	588 ±22 ml	13.4 cmH_2O
LMA-Unique	567* ±7 ml	12.9 * cmH_2O
SoftSeal	649* ±4 ml	15.8 * cmH_2O
LTD	725* ±3 ml	15.9 * cmH_2O
LaryVent	672* ±22 ml	15.2 * cmH_2O

Data are mean±SD (tidal volume) or mean (peak airway pressure); * = $p<0.01$ when compared with facemask.
Difference of tidal volume compared to facemask ventilation was -3.6% for LMA-Unique, +10.4% for SoftSeal, +23.3% for LTD and +14.3% for LaryVent with the above settings.
Conclusion(s): All devices tested allow sufficient ventilation in the bench model chosen. Differences to the tidal volume set in the respirator and to the tidal volume reached with facemask ventilation vary, hinting at differences in the quality of airway seal with the single-use airway devices. Evaluation in clinical studies is warranted.
References: (1) Miller DM, Anaesthesia 2001;56:1069-1072 (2) Clery G, Anesth Analg 2003;97:1189-1191
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