

SINGLE-USE AIRWAY DEVICES: INFLUENCE OF AN ITV ON VENTILATION WITH LMA-UNIQUE, SOFTSEAL AND LTD IN A BENCH MODEL**Genzwuerker H.V.* (1), Hinkelbein J. (1), Finteis T. (1), Roth H. (1), Schmeck J. (1)***(1) Inst. of Anaesthesiology, University Hospital Mannheim, Mannheim, Germany***Background:**

Use of an impedance threshold valve (ITV) improves cerebral and myocardial perfusion by more than 80% during cardiopulmonary resuscitation by preventing air from passively entering the thorax and therefore increasing venous return to the heart (1). The effect on airway resistance has not been addressed so far. An ITV (ResQPOD, Zoll Medical Corp., USA) is tested in different single-use airway devices that may be used for emergency airway management as alternatives to facemask ventilation.

Methods.

In a bench model consisting of a Ambu Megacode Station connected to a PC (Megacode software 2.23), standardized ventilation (IPPV, respiratory rate 12/min, tidal volume 750 ml) was performed with a Draeger Oxylog 3000 (Draeger medical). Tidal volumes and peak airway pressures were measured. 3-minute cycles (10 per device) were performed with facemask, LMA-Unique (LMA Company), SoftSeal (Smiths) and Laryngeal Tube Disposable LTD (VBM Medical), all size #4. Ventilation cycles were repeated with the ITV (total 40 cycles without, 40 cycles with ITV). Cuff pressures were adjusted to 80 cm H₂O were applicable. For statistical analysis, the t-test was used.

Results.

Tidal volumes (mean±SD) and peak airway pressures for the airway devices without/with ITV were 588±22/579±17 ml and 13.4/14.9* cmH₂O for facemask, 567±7/498*±14 ml and 12.9/12.9 cmH₂O for LMA-Unique, 649±4/628*±4 ml and 15.8/16.7* cmH₂O for SoftSeal, and 724±3/691*±3 ml and 15.9/16.0 for LTD (* = p<0.01 compared to ventilation without ITV). Tidal volume with ITV decreased by 1.5% for facemask, 12.1% for LMA-Unique, 3.2% for SoftSeal and 4.6% for LTD.

Conclusion.

While the ITV significantly decreases tidal volumes in all single-use supraglottic devices tested, the positive effect on cardiac output must be considered to be of much greater clinical relevance.

Reference: (1) Lurie KG, Crit Care Med 2002;30(Suppl.):S162-165