

LMA: a big choice

A. LARSSON

Department of Anaesthesiology and Intensive Care, Aalborg hospital, Aarhus University Hospitals, Aalborg, Denmark

OBESITY is becoming more common in the general population, and consequently more obese patients are undergoing anesthesia and surgery. Obesity is associated with intra- and post-operative respiratory complications. Particularly in obesity, general anesthesia with endotracheal intubation quickly produces atelectasis at induction.¹ The atelectasis formation can be prevented or attenuated by using a continuous positive airway pressure¹ or reducing the inspired oxygen concentration at pre-oxygenation,² and then continuing with a positive end-expiratory pressure during the rest of the anesthesia.³ However, it is not known whether these precautions change the post-operative course. In this issue of the journal, a study by Zoremba et al.⁴ suggests that using a laryngeal mask airway (LMA) and avoiding muscle relaxation reduce post-operative deterioration of lung function, compared with tracheal intubation, in moderately obese patients undergoing a minor surgery. The study comprised 134 patients, and it found that pulse-oximetry saturation and common spirometry parameters were less affected in the LMA group, and the authors proposed that the use of LMA could be an alternative to tracheal intubation in this patient category. We agree with this conclusion but consider that it is important to interpret the results by Zoremba et al.⁴ with caution. It is known that insertion of an LMA does not induce bronchoconstriction in contrast to tracheal intubation.^{5,6} However, this cannot explain their findings. One could also speculate whether an LMA allows the normal expiratory resistance by the vocal cords to induce an intrinsic positive end-expiratory pressure, and in this way reduce atelectasis formation. However, there are some important differences in the management, other than the use of LMA, between the groups studied by Zoremba and colleagues. First, although both groups were

pre-oxygenated with 100% oxygen, 100% oxygen was used (without any positive end-expiratory pressure) during the first breaths post-intubation in the tracheal intubation group, whereas in the LMA group 80% oxygen was used immediately after LMA insertion. Because atelectasis formation occurs very quickly due to absorption in regions with airway closure,¹ this could well explain the findings by Zoremba et al.⁴ Second, although the train of four (TOF) ratio was >90% at extubation and extubation was not performed earlier than 40 min after muscle relaxant administration, a residual neuromuscular block might be possible in the endotracheal intubation group. Residual neuromuscular block is associated with pulmonary complications.⁷ Debaene et al.⁸ found after a single dose ($2 \times \text{ED}_{95}$) of a short-acting muscle relaxant (vecuronium, rocuronium or atracurium) that 37% of the patients had a neuromuscular residual blockade at 2 h after the administration of the muscle relaxant. ED_{95} of rocuronium is equal to 0.6 mg/kg, which is comparable to the induction dose given by Zoremba et al.⁴ Nevertheless, independent of whether the findings of Zoremba et al.⁴ in the tracheal intubation group were caused by tracheal intubation *per se*, high inspired oxygen concentration at induction, or the effect of muscle relaxation during and after anesthesia, the study undoubtedly indicates that LMA may be used in selected moderately obese patients undergoing a minor surgery.

References

1. Coussa M, Proietti S, Schnyder P, Frascarolo P, Suter M, Spahn DR, Magnusson L. Prevention of atelectasis formation during the induction of general anesthesia in morbidly obese patients. *Anesth Analg* 2004; **98**: 1491–5.

Editorial

2. Edmark L, Kostova-Aherdan K, Enlund M, Hedenstierna G. Optimal oxygen concentration during induction of general anesthesia. *Anesthesiology* 2003; **98**: 28–33.
3. Pelosi P, Ravagnan I, Giurati G, Panigada M, Bottino N, Eccher G, Gattinoni L. Positive end-expiratory pressure improves respiratory function in obese but not in normal subjects during anesthesia and paralysis. *Anesthesiology* 1999; **91**: 1221–31.
4. Zoremba M, Eberhart L, Braunecker S, Wulf H. Comparison between intubation and the laryngeal mask airway- effects on postoperative lung function tests in moderately obese patients. *Acta Anaesthesiol Scand* 200xxx.
5. Kim ES, Bishop MJ. Endotracheal intubation, but not laryngeal mask airway insertion, produces reversible bronchoconstriction. *Anesthesiology* 1999; **90**: 391–4.
6. Alison B, Brimacombe J, Keller C, Verghese C. Pulmonary airway resistance with the endotracheal tube versus laryngeal mask in paralyzed anesthetized adult patients. *Anesthesiology* 1999; **90**: 395–7.
7. Berg H, Roed J, Viby-Mogensen J, Mortensen CR, Engbaek J, Skovgaard LT, Krintel JJ. Residual neuromuscular block is a risk factor for postoperative pulmonary complications. A prospective, randomised, and blinded study of postoperative complications after atracurium, vecuronium and pancuronium. *Acta Anaesthesiol Scand* 1997; **41**: 1095–103.
8. Debaene B, Plaud B, Dilly M-P, Donati F. Residual paralysis in the PACU after a single intubating dose of nondepolarizing muscle relaxant with an intermediate duration of action. *Anesthesiology* 2003; **98**: 1042–8.

Address:
Anders Larsson
Department of Anaesthesiology and Intensive Care
Aalborg hospital
Aarhus University Hospitals
9000 Aalborg
Denmark
e-mail: laasl@rn.dk