

Correspondence

Increasing tidal volumes and PEEP is an effective method of alveolar recruitment

To the Editor:

Atelectasis following general anesthesia (GA) is a regular finding caused by reduction in the functional residual capacity (FRC).¹ Atelectasis decreases partial pressures of oxygen in arterial blood (PaO₂). Reduction in FRC correlates well with an increase in alveolar to arterial differences of partial pressures for oxygen (PAO₂-PaO₂).² This difference in PAO₂-PaO₂ changes with variation in the FiO₂; however, ratio of alveolar to arterial oxygen partial pressures (PaO₂/FiO₂) is less dependent on the FiO₂.³

In this study we observed the effect of alveolar recruitment by increasing tidal volume from 8-18 mL·kg⁻¹ (for ten breaths) along with a positive end-expiratory pressure (PEEP) of 5 cm of H₂O on oxygenation during GA. Seventeen adults undergoing elective surgery, and operated in the supine position were included. Initial ventilator settings included a PEEP of 5 cm H₂O. Arterial blood gas analysis (ABG) was performed at 30 (basal), 40, 60, 90 and 150 min following GA. Alveolar recruitment was applied after the basal ABG. Statistical analysis was performed using ANOVA. Mean peak inspiratory pressure and plateau pressure observed at the time of alveolar recruitment were 30.00 ± 9.55 cm H₂O and 24.90 ± 7.48 cm H₂O respectively. Postoperative chest *x-ray* revealed no evidence of barotrauma.

Alveolar recruitment resulted in a significant increase in the PaO₂, PaO₂/FiO₂ ratio and compliance along with a significant decrease in the PAO₂-PaO₂ during the study period (Table). Alveolar recruitment is an effective way of maintaining a desirable PaO₂

during GA. Increasing the tidal volume from 8-18 mL·kg⁻¹ (+ PEEP 5 cm H₂O) was not associated with adverse events. Alveolar recruitment also results in better lung compliance - a prophylactic strategy for the prevention of lung injuries observed during mechanical ventilation.

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References

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- 2 Hickey RE, Visick WD, Fairley HB, Fourcade HE. Effects of halothane anesthesia on functional residual capacity and alveolar-arterial oxygen tension difference. *Anesthesiology* 1973; 38: 20-4.
- 3 Doyle DJ. Arterial/alveolar oxygen tension ratio: a critical appraisal. *Can Anaesth Soc J* 1986; 33: 471-4.

Burst suppression ratio is the only determinant for BIS values below 30

To the Editor:

I read the article by Mérat *et al.* about bispectral index (BIS) monitoring and severe cerebral ischemia¹ with interest.

TABLE PaO₂, compliance (mL·cm⁻¹ H₂O), PAO₂ - PaO₂, PaO₂/FiO₂ values (mean ± SD) at different time points. * Significant difference from basal value *P* < 0.05.

Variables	Time in minutes following general anesthesia				
	Basal (30)	40	60	90	150
PaO ₂	204.7 ± 39	285.8 ± 45.3*	281.1 ± 39.7*	275.5 ± 43.3*	280.8 ± 37.2*
PAO ₂ -PaO ₂	135.3 ± 39	54.2 ± 45.3*	58.9 ± 39.7*	64.5 ± 43.3*	59.2 ± 37.2*
PaO ₂ /FiO ₂	409.4 ± 117	571.6 ± 135.9*	562.2 ± 119.1*	551 ± 129.9*	561.6 ± 111.6*
Compliance	27.8 ± 7.3	33.5 ± 6.1*	35.7 ± 7.4*	39.26 ± 0.5*	41.2 ± 4.4*