

Dose sparing of opioids and anaesthetics with pre-operative dexmedetomidine

Sir,

I have read with great interest the recent article "Attenuation of pressor response and dose sparing of opioids and anaesthetics with pre-operative dexmedetomidine" in this journal of international repute, and I would like to address some concerns.^[1] This study stresses that dexmedetomidine decreases the dose of opioid and isoflurane required to achieve adequate analgesia and anaesthesia.

White in his editorial mentioning the work of Ura states that 1.3 minimum alveolar concentrations (MAC) (SD 0.34) isoflurane blocks adrenergic responses to skin incision and it decreases with concomitant use of fentanyl.^[2] In the study by Lee, the median time for end-tidal concentration of isoflurane to reach 80% of inspiratory concentration was 19 min with an interquartile range of 12 min.^[3]

Carbon dioxide (CO₂) production and alveolar ventilation are major determinants of arterial CO₂ if there is no CO₂ rebreathing.^[4] As alveolar concentration of CO₂ is determined by production of CO₂ and fresh gas flow (FGF), it can be assumed that if CO₂ production is constant then alveolar CO₂ is determined by FGF to alveoli in optimal conditions.^[4] In patients with normal ventilation perfusion ratio, end-tidal carbon-di-oxide (ETCO₂) monitoring can be an estimate of arterial CO₂.^[5]

As alveolar ventilation is a major determinant governing uptake of potent inhaled anaesthetics,^[6] considering the above-mentioned facts, every patient should have been ventilated to a predetermine ETCO₂ with predetermined FGF to remove minute ventilation as the confounding factor in the study by Bajwa *et al.* The article mentions that the concentration of isoflurane was adjusted in increments of 0.2%, and it was not apparent what the time limit that was allowed to reach equilibrium.^[1] Again as the mode (manual or mechanical) of ventilation or the ETCO₂ was not specified at any moment during the study period, I assume that the alveolar concentration of isoflurane may not have been distributed normally among the study population.^[1]

Considering the above facts, in the study by Bajwa

et al., a predefined period (to allow equilibration time prior to skin incision) with a fixed protocol-based adjustment of inhalational agent, fresh gas flow, and ventilation pattern to maintain a predefined end-tidal CO₂ level was necessary to attain a steady level of depth of anaesthesia, so that meaningful conclusion could be drawn regarding fentanyl or isoflurane sparing effect of dexmedetomidine in the absence of end-tidal isoflurane and bispectral index monitoring facility.

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