

Desaturation After Remifentanil-Propofol Induced Apnea

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Abstract

Background: In an earlier study investigating the can't ventilate/can't intubate clinical scenario, induction of anesthesia with thiopental 5 mg/kg and succinylcholine 1.0 mg/kg was associated with a significant risk of oxyhemoglobin desaturation. In that study, it appeared that the long duration of succinylcholine-induced apnea was responsible for the desaturation. Our hypothesis was that avoiding succinylcholine by using propofol and remifentanil to facilitate tracheal intubation would prevent prolonged apnea and subsequent desaturation. We attempted to identify a dose of remifentanil which, in combination with propofol 2 mg/kg, was sufficient to provide good conditions for tracheal intubation, but small enough that spontaneous ventilation would recover before desaturation occurred.

Methods

24 healthy volunteers aged 18-45 yr were studied. After preoxygenation to an end-tidal oxygen concentration > 90%, subjects received remifentanil either 2.0 or 1.5 g/kg (n = 12 for each dose) followed by propofol 2 mg/kg. Oxygen saturation (SpO₂) was measured at three sites: fingertip, ear lobe and forehead (beat to beat). If the SpO₂ decreased below 80%, the volunteers received chin lift and, if necessary, assisted

ventilation. Conditions for tracheal intubation, duration of apnea, incidence of desaturation, and lowest SpO₂ were recorded.

Results

Apnea duration and lowest SpO₂ were significantly related (P < 0.05). Desaturation to 80% or below occurred in 4 of 12 subjects who received remifentanil 2.0 g/kg and in 1 of 12 who received 1.5 g/kg. Conditions for tracheal intubation were acceptable in 11 of 12 subjects who received remifentanil 2.0 g/kg and in 5 of 12 who received 1.5 g/kg (P < 0.05).

Conclusions

When used in conjunction with propofol 2 mg/kg, remifentanil 2.0 g/kg produces good conditions for tracheal intubation but results in a period of apnea that carries a significant risk of desaturation. Decreasing the dose of remifentanil results in inadequate conditions for tracheal intubation, and still carries a risk of desaturation to < 80%. We conclude that in the can't ventilate/can't intubate clinical scenario, spontaneous recovery from induction with propofol and remifentanil does not occur sufficiently quickly to avoid significant risk of desaturation.

Reference

1. Heier T. et al *Anesthesiology* 2001; 94:754-759