

## Pharmacological Treatment of Hypoxemia during One-lung Ventilation

To the Editor:

We read with great interest the Case Scenario on hypoxemia during one-lung ventilation (OLV) reported by Rozé *et al.*,<sup>1</sup> and we would like to add some comments on pharmacological treatment.

First, the title of the section, "Pharmacological treatment to limit hypoxic pulmonary vasoconstriction," could, in our opinion, lead to confusion. Almitrine does not limit hypoxic pulmonary vasoconstriction but enhances this mechanism in nonventilated areas. Inhaled nitric oxide can inhibit hypoxic pulmonary vasoconstriction in patients with chronic obstructive pulmonary disease breathing room air<sup>2</sup>; however, during OLV this gas vasodilates ventilated lung areas, shifting the pulmonary blood flow toward these zones without modifying hypoxic pulmonary vasoconstriction.<sup>3</sup>

Regarding the use of inhaled nitric oxide, a European board of experts on this topic concluded that there is no evidence to support the routine use of inhaled nitric oxide for the prevention or reversal of hypoxemia during OLV, although some patients with severe hypoxemia may benefit from this drug.<sup>4</sup> On the other hand, the text suggests that inhaled nitric oxide improves hypoxemia only when it is used with positive end-expiratory pressure, but it has also been useful when administered without positive end-expiratory pressure in patients with severe hypoxemia.<sup>5</sup>

Concerning almitrine, the hemodynamic effects on pulmonary circulation are dose-related,<sup>6,7</sup> and pulmonary hypertension is not expected if a low-dose combined with inhaled nitric oxide is used during OLV.<sup>6</sup> Peripheral neuropathy related to almitrine has been observed in patients who received this drug for several months, usually with complete recovery,<sup>8</sup> and is related to high plasma concentrations of almitrine (400 ng/ml).<sup>9</sup> However, when low-dose almitrine is administered for a short time its plasma concentration is less than the concentration seen with long-term therapy<sup>6,7</sup> and returns to values close to zero within 12 h after cessation of the infusion.<sup>7</sup>

Almitrine and inhaled nitric should not be used routinely. Nevertheless, they can dramatically improve oxygenation<sup>6,10,11</sup> and thus might be considered as alternative treatments when other strategies fail to improve hypoxemia during OLV.

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## In Reply:

Thank you for your interest in our article.<sup>1</sup> We read with great interest Dr. Russell's study reporting beneficial effects of intermittent positive airway pressure on the nonventilated lung in patients suffering from hypoxemia (*i.e.*, pulse oximetry less than 95%) during one-lung ventilation (OLV).<sup>2</sup> Oxygen administered into the nondependent lung should be used to treat and prevent hypoxemia during OLV. As mentioned in our article,<sup>1</sup> oxygen may be used in different ways on the nondependent lung with or without continuous positive airway pressure and transient reinflation of the collapsed lung without interfering with surgery. The