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Dopexamine but not dopamine increases gastric mucosal oxygenation during mechanical ventilation in dogs.

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OBJECTIVE: To compare the effects of dopamine and dopexamine on gastric mucosal oxygenation during mechanical ventilation without and with positive end-expiratory airway pressure (PEEP) and after compensation of the PEEP-induced hemodynamic suppression. **DESIGN:** Randomized controlled animal study. **SETTING:** University research department of experimental anesthesiology. **SUBJECTS:** Ten anesthetized dogs with chronically implanted ultrasound flow probes around the pulmonary artery for continuous measurement of cardiac output. **INTERVENTIONS:** On different days, the dogs randomly received dopamine (2.5 and 5.0 microg x kg(-1) x min(-1), n = 10), dopexamine (0.5 and 1.0 microg x kg(-1) x min(-1)) without (n = 8) or with pretreatment with a selective beta2-adrenoceptor antagonist (ICI 118,551, n = 7), or saline (control, n = 7). To simulate common clinical situations, these interventions were performed during different ventilation modes: during mechanical ventilation without and with high levels of PEEP, and after compensation of the PEEP-induced systemic hemodynamic suppression by titrated volume resuscitation with hydroxyethyl starch. **MEASUREMENTS AND MAIN RESULTS:** We continuously measured microvascular hemoglobin saturation ($\mu\text{-HbO}_2$) by light-guide spectrophotometry in the gastric mucosa. Dopexamine, but not dopamine, significantly increased gastric mucosal $\mu\text{-HbO}_2$ by about 20%, regardless of the dose and the ventilation mode. Both catecholamines dose-dependently increased cardiac output and oxygen delivery by up to 75% without effects on systemic oxygen saturation. The effects of dopexamine on $\mu\text{-HbO}_2$ as well as on cardiac output and oxygen delivery were prevented by selective beta2-adrenoceptor-blockade. **CONCLUSIONS:** Dopexamine but not dopamine improved gastric mucosal oxygenation in dogs. This effect was independent of the dosage and the ventilation mode. Thus, dopexamine may reverse a decrease in splanchnic oxygenation induced by ventilation with PEEP. The dopexamine-induced increase in gastric mucosal oxygenation was mediated by beta2-adrenoceptors, which explains the superior effects of dopexamine to dopamine on $\mu\text{-HbO}_2$. The regional effects of both catecholamines were not mirrored by systemic hemodynamics.

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