

Crit Care Med. 2003 Jul;31(7):1999-2005.  
Related Articles, Links

Fenoldopam--but not dopamine--selectively increases gastric mucosal oxygenation in dogs.

Schwarte LA, Picker O, Schindler AW, Fournell A, Scheeren TW.

Department of Anesthesiology, University Hospital of Dusseldorf, Germany.

**OBJECTIVE:** To compare the effects of fenoldopam and dopamine on gastric mucosal and systemic oxygenation, and to identify the receptors involved. **DESIGN:** Randomized controlled animal study. **SETTING:** University research department of experimental anesthesiology. **SUBJECTS** Seven anesthetized dogs with chronically implanted ultrasound flow probes around the pulmonary artery for continuous measurement of cardiac output. **INTERVENTIONS:** On different days, the dogs received in random order either the selective DA(1)-agonist fenoldopam (0.1 and 1.0 microg x kg<sup>-1</sup> x min<sup>-1</sup>, with or without DA(1)-blocker pretreatment), dopamine (2.5 and 5.0 microg.kg<sup>-1</sup> x min<sup>-1</sup>, with or without alpha(1)-blocker pretreatment), or saline (control). **MEASUREMENTS AND MAIN RESULTS:** We continuously measured regional microvascular hemoglobin oxygen saturation (muHbO(2)) in gastric mucosa by reflectance spectrophotometry, and systemic oxygen delivery. Fenoldopam increased gastric mucosal muHbO(2) by approximately 20%, and this effect was prevented by selective DA(1)-receptor blockade. In contrast, dopamine neither alone nor during alpha(1)-blockade altered muHbO(2). With respect to systemic measures of oxygen transport, fenoldopam had negligible effects, whereas dopamine (with and without alpha(1)-blocker pretreatment) dose-dependently increased cardiac output and systemic oxygen delivery by approximately 30%. **CONCLUSIONS:** Fenoldopam dose-dependently increased microvascular oxygenation of the gastric mucosa without changing systemic oxygen transport, i.e., this drug acted selectively on the splanchnic mucosa. The increase in gastric mucosal oxygenation was mediated by DA(1)-receptors. In contrast, dopamine markedly increased systemic oxygen transport, but did not affect microvascular oxygenation of gastric mucosa. This lacking effect on gastric mucosal oxygenation was not caused by alpha(1)-mediated vasoconstriction. The regional effects of both catecholamines could not be deduced from systemic hemodynamics and oxygenation.

PMID: 12847395 [PubMed - indexed for MEDLINE]