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## **Dopamine-1-receptor stimulation and mucosal tissue oxygenation in the porcine jejunum.**

Germann R, Hasibeder W, Haisjackl M, Sparr H, Luz G, Pernthaler H, Friesenecker B, Bonatti J, Gruber E, Schwarz B.

Department of Anesthesia and General Intensive Care Medicine, University of Innsbruck, Austria.

**OBJECTIVE:** To evaluate the effects of dopamine-1-receptor stimulation on intestinal mucosal tissue oxygenation. **DESIGN:** Prospective, experimental, controlled trial. **SETTING:** Animal research laboratory. **SUBJECTS:** Anesthetized domestic pigs (30 to 45 kg). **INTERVENTIONS:** A small segment of the jejunal mucosa and serosa was exposed by midline laparotomy and antimesenteric incision. Fenoldopam, a selective dopamine-1-receptor agonist, was infused in steps, exponentially increasing from 0.6 to 9.6 micrograms/kg/min via a central venous catheter (n = 8, fenoldopam group), whereas a second group (n = 6, saline group) was only given the solvent. **MEASUREMENTS AND MAIN RESULTS:** Systemic hemodynamics as well as systemic and jejunal acid base and blood gas variables were measured using an arterial catheter, a thermodilution pulmonary artery catheter, and a jejunal venous catheter. Jejunal mucosal and serosal tissue PO<sub>2</sub> were measured by means of Clark-type surface oxygen electrodes. Oxygen saturation and relative concentration of mucosal microvascular hemoglobin were measured by means of tissue reflectance spectrophotometry. In the fenoldopam group, systemic oxygen delivery (12.5 +/- 0.8 mL/kg/min at baseline) increased by 56% (p < .001) above baseline values. Mean arterial pressure remained unchanged. Fenoldopam produced a 51% increase in mucosal PO<sub>2</sub> (23.8 +/- 2.8 torr [3.2 +/- 0.4 kPa] at baseline; p < .001) and a 31% increase in mucosal hemoglobin oxygen saturation (55.4 +/- 8.3% at baseline; p < .001), but not change in serosal PO<sub>2</sub> (58 +/- 4.8 torr [7.7 +/- 0.6 kPa] at baseline). **CONCLUSIONS:** Fenoldopam improves tissue oxygenation of the porcine jejunum in a dose-related manner. This effect is limited to the inner mucosal layer. Dopamine-1-receptor agonists should be evaluated in patients presenting with signs of intestinal mucosal ischemia.

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