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Dopamine and mucosal oxygenation in the porcine jejunum.

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The effect of intravenously delivered dopamine on jejunal tissue oxygenation was studied in 12 pigs anesthetized with midazolam and sufentanil and mechanically ventilated. A small segment of the jejunal mucosa and serosa was exposed by midline laparotomy and antimesenteric incision. Mucosal and serosal tissue PO₂, mucosal microvascular hemoglobin oxygen saturation, and mucosal hemoglobin concentration were measured by means of Clark-type oxygen electrodes and tissue reflectance spectrophotometry, respectively. In five animals electromyogenic potentials of the jejunal wall were recorded. Measurements were performed under baseline conditions and after intravenous infusion of 2, 4, 8, 16, 32, and again 2 micrograms.kg⁻¹.min⁻¹ of dopamine. The drug produced a dose-related increase in mucosal PO₂ (from 26.5 Torr at baseline to 49 Torr at 32 micrograms of dopamine; $P < 0.001$) and mucosal hemoglobin oxygen saturation (from 55.1 to 70.1%; $P < 0.03$) but no change in serosal PO₂ (from 70.6 to 65.5 Torr). In nine animals baseline mucosal PO₂ and mucosal hemoglobin oxygen saturation showed rhythmic oscillations with a frequency of 2.5-5 cycles/min that could not be related to electromyogenic potentials. Dopamine decreased the oscillation amplitude of these two parameters ($P < 0.001$), and at doses > 16 micrograms.kg⁻¹.min⁻¹ they were no longer present. Dopamine therefore improves mucosal oxygenation of the porcine jejunum in a selective and dose-related manner. At higher doses the preexisting oscillatory pattern of mucosal oxygenation, which is most likely due to vasomotion, is impeded.

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