Arginine vasopressin reduces intestinal oxygen supply and mucosal tissue oxygen tension.


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We investigated intestinal oxygen supply and mucosal tissue PO2 during administration of increasing dosages of continuously infused arginine vasopressin (AVP) in an autoperfused, innervated jejunal segments in anesthetized pigs. Mucosal tissue PO2 was measured by employing two Clark-type surface oxygen electrodes. Oxygen saturation of jejunal microvascular hemoglobin was determined by tissue reflectance spectrophotometry. Microvascular blood flow was assessed by laser-Doppler velocimetry. Systemic hemodynamic variables, mesenteric venous and systemic acid-base and blood gas variables, and lactate measurements were recorded. Measurements were performed at baseline and at 20-min intervals during incremental AVP infusion (n = 8; 0.007, 0.014, 0.029, 0.057, 0.114, and 0.229 IU.kg(-1).h(-1), respectively) or infusion of saline (n=8). AVP infusion led to a significant (P < .05), dose-dependent decrease in cardiac index (from 121 +/- 31 to 77 +/- 27 ml.kg(-1).min(-1) at 0.229 IU.kg(-1).h(-1)) and systemic oxygen delivery (from 14 +/- 3 to 9 +/- 3 ml.kg(-1).min(-1) at 0.229 IU.kg(-1).h(-1)) concomitant with an increase in systemic oxygen extraction ratio (from 31 +/- 4 to 48 +/- 10%). AVP decreased microvascular blood flow (from 133 +/- 47 to 82 +/- 35 perfusion units at 0.114 IU.kg(-1).h(-1)), mucosal tissue PO2 (from 26 +/- 2 mmHg at 0.229 IU.kg(-1).h(-1)), and microvascular hemoglobin oxygen saturation (from 51 +/- 9 to 26 +/- 12% at 0.229 IU.kg(-1).h(-1)) without a significant increase in mesenteric venous lactate concentration (2.3 +/- 0.8 vs. 3.4 +/- 0.7 mmol/l). We conclude that continuously infused AVP decreases intestinal oxygen supply and mucosal tissue PO2 due to a reduction in microvascular blood flow and due to the special vascular supply in the jejunal mucosa in a dose-dependent manner in pigs.

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