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Effects of short-term endotoxemia and dopamine on mucosal oxygenation in porcine jejunum.

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Effects of *Escherichia coli* lipopolysaccharide (2 micrograms.kg⁻¹.20 min⁻¹; LPS), given systemically (S) or via superior mesenteric artery (M), and consecutive dopamine infusion (16 micrograms.kg⁻¹.20 min⁻¹) on jejunal mucosal tissue O₂ tension (PO₂muc) and serosal tissue O₂ tension (PO₂ser; Clark-type surface electrodes) and jejunal mucosal microvascular hemoglobin O₂ saturation (HbO₂muc; tissue reflectance spectrophotometry) were investigated in a hemodynamically stable pig model. Twenty-one pigs were anesthetized, paralyzed, and mechanically ventilated. After laparotomy, a mesenteric venous catheter was inserted and a jejunal antimesenteric enterotomy performed. LPS-infused animals developed similar degrees of pulmonary hypertension. No differences in cardiac output and mean arterial blood pressure between groups were found. PO₂muc and HbO₂muc were significantly lower in M animals compared with control (C) [210 min; PO₂muc: 7.12 +/- 1.81 (M), 19.01 +/- 3.12 mmHg (C); HbO₂muc: 28.78 +/- 3.36 (M), 49.09 +/- 3.84% (C)], whereas S animals ranged in between (PO₂muc: 13.36 +/- 2.2 mmHg; HbO₂muc: 40.68 +/- 4.43%). Of measured PO₂muc values, 12.6 (C), 20.6 (S), and 46.3% (M) ranged from 0 to 5 mmHg. PO₂ser was lower in LPS animals compared with control [59.43 +/- 5.4 (C), 45.00 +/- 6.12 (S), 47.33 +/- 4.34 (M) mmHg]. Dopamine increased PO₂muc and HbO₂muc to similar absolute values and significantly decreased frequency of PO₂muc (0-5 mmHg) in M animals. We conclude that LPS impairs mucosal tissue oxygenation independently of systemic hemodynamics. Mucosal microvascular dysfunction depends on regional LPS concentrations. Under conditions of compromised tissue oxygenation, dopamine significantly improves PO₂muc and HbO₂muc.

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