Titel: Norepinephrine is superior to Epinephrine in increasing gastric mucosal oxygenation.

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Background: Maintenance of adequate microcirculatory oxygenation is crucial for the integrity of the gastric mucosa [1]. In this context, the effects of the naturally occurring catecholamines epinephrine (EPI) and norepinephrine (NOR) are unclear. EPI could increase gastric mucosal oxygenation (µHbO2) by increasing oxygen delivery (DO2) while NOR is supposed to decrease µHbO2 by increasing vascular resistance.

Methods: Six anaesthetized and mechanically ventilated dogs (sevoflurane 1.5 MAC, FiO2 0.3, etCO2 35 mmHg) received increasing doses (0, 0.05, 0.1 and 0.2 µg/kg/min) of either EPI or NOR. µHbO2 was measured by reflectance spectrophotometry [2] and the results were related to DO2 and oxygen consumption (VO2). Statistics: Means±SEM, ANOVA, p<0.05.

Results: Despite a substantial increase in DO2 from 12.3±1 to 26.5±3 ml/kg/min, EPI did not increase µHbO2, jet µHbO2 was lowered at 0.05 µg/kg/min of EPI. In contrast, NOR only slightly changed DO2 from 12.3±1 to 19.9±2 ml/kg/min, whereas µHbO2 increased dose dependent from 57±1% to 67±1%. For EPI and NOR, vascular resistance always paralleled the course of µHbO2. Both catecholamines increased VO2 similarly by about 15%.

Conclusions: NOR is superior to EPI in increasing µHbO2 despite a higher DO2 during EPI-infusion. This phenomenon may be partly explained by a redistribution of blood flow to the gastric mucosa which could result from increased vascular resistance during NOR at extramucosal tissue. Thus for optimizing gastric mucosal oxygenation NOR should be preferred to EPI.