

18th Annual Congress of ESICM, Amsterdam, 2005

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

Schwarte L.A., Schwartges I., Fournell A., Scheeren T.W.L., Picker O.
Klinik für Anaesthesiologie, Universitätsklinikum Düsseldorf, Germany

Background: Maintenance of adequate microcirculatory oxygenation is crucial for the integrity of the gastroic mucosa [1]. In this context, the effects of the naturally occurring catecholamines epinephrine (EPI) and norepinphrine (NOR) are unclear. EPI could increase gastroic mucosal oxygenation (μHbO_2) by increasing oxygen delivery (DO_2) while NOR is supposed to decrease μHbO_2 by increasing vascular resistance.

Methods: Six anaesthetized and mechanically ventilated dogs (sevoflurane 1.5 MAC, FiO_2 0.3, etCO_2 35 mmHg) received increasing doses (0, 0.05, 0.1 and 0.2 $\mu\text{g/kg/min}$) of either EPI or NOR. μHbO_2 was measured by reflectance spectrophotometry [2] and the results were related to DO_2 and oxygen consumption (VO_2). Statistics: Means \pm SEM, ANOVA, $p < 0.05$.

Results: Despite a substantial increase in DO_2 from 12.3 ± 1 to 26.5 ± 3 ml/kg/min, EPI did not increase μHbO_2 , jet μHbO_2 was lowered at 0.05 $\mu\text{g/kg/min}$ of EPI. In contrast, NOR only slightly changed DO_2 from 12.3 ± 1 to 19.9 ± 2 ml/kg/min, whereas μHbO_2 increased dose dependent from $57 \pm 1\%$ to $67 \pm 1\%$. For EPI and NOR, vascular resistance always paralleled the course of μHbO_2 . Both catecholamines increased VO_2 similarly by about 15%.

Conclusions: NOR is superior to EPI in increasing μHbO_2 despite a higher DO_2 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.

Reference: 1. Sato N, Kawano S; Tsuji S etal. (1988) J Clin Gastroenterol 10:12-18.