**Microvascular fluid homeostasis during cardio-pulmonary bypass (CPB) in a porcine model**

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**Background:** Sevoflurane and isoflurane are both commonly used agents during cardiac surgery. Whether there are differences between the different volatile anesthetics in this setting is unknown. Isoflurane in contrast to sevoflurane has been shown to increase trans-endothelial albumin permeability in rat lungs, both in-vitro and in-vivo. Previously a general increase of vascular permeability affecting most organs was observed with isoflurane-, but not with propofol-anesthesia. We compared sevoflurane to isoflurane with respect to fluid loading and fluid extravasation during CPB.

**Materials and methods:** 16 pigs were randomly allocated into two study groups receiving isoflurane 1.2 vol% (I-group, n=8) or sevoflurane 1.8 vol% (S-group, n=8). All animals underwent 120 min tepid CPB. Fluid requirements, plasma volume, colloid osmotic pressures in plasma and interstitial fluid, haematocrit levels, and total tissue water content were recorded, and fluid extravasation rates calculated.

**Results:** After start of CPB plasma volume of the S-group remained unchanged, whereas plasma volume of the I-group decreased. Net fluid balance turned out to be larger in the S-group than in the I-group early during CPB. Colloid osmotic pressure in plasma tended to be lower in the S-group than the I-group throughout the CPB period.

**Conclusion:** Fluid extravasation rates were not influenced neither by isoflurane nor sevoflurane anaesthesia. Net fluid balance was higher during sevoflurane anaesthesia and resulted in preservation of the intravascular volume as reflected by plasma volume determination.

**Keywords:** CPB, Homestasis, anesthetics, fluid balance