

Role of endogenous opioids in the cardiovascular responses to asphyxia in fetal sheep

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Intravenous administration of the opioid receptor antagonist naloxone to asphyxiated fetal sheep increases the arterial blood pressure. We examined the hypothesis that endogenous opioids modify the cardiac output distribution during asphyxia due to changes in the vascular resistance of some fetal organs. Thirteen fetal sheep (0.8-0.9 of gestation) were chronically catheterized. Fetal asphyxia was induced by reducing the uterine blood flow with an inflatable occluder around the common internal iliac artery to ~50% of control for 40 min. Naloxone solution or the solvent alone was added for the last 20 min. Asphyxia caused hypertension, and the fetal arterial blood pressure further increased when asphyxiated fetuses received naloxone. Heart, brain, and adrenal blood flows increased due to the increase in blood pressure, with no changes in their vascular resistances. In contrast, kidney and carcass blood flows decreased, and their vascular resistances increased. We conclude that endogenous