Fetal propofol and dexmedetomidine exposure during elective C-section in the bitch: impact on pup viability

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Elective C-section is a common procedure recommended in dogs at risk of dystocia(1). Anesthetics administered at surgery can cross the placenta leading to distress up to neonatal mortality(2). The study aims to determine the impact on pup viability of a new anesthetic-analgesic protocol for elective C-section in the bitch. For this purpose, propofol (PPF) and dexmedetomidine (DEX) concentrations in maternal blood, amniotic fluid and placental tissue were correlate to neonatal parameters. Nine purebred bitches (age 4,9±2,3 years; weight 39,8±10,4 kg) were induced with a combination of PPF at 2,5 mg/kg and DEX at 2 µg/kg IV and maintained with isoflurane in 100% oxygen for elective C-section. If needed, additional doses of PPF were administered to effect in order to achieve intubation of patients. DEX and PPF quantification from the different biological matrices was carried out by HPLC-MS and HPLC-FL methods. Neonatal viability at birth was assessed with a modified Apgar score(3) (AS) and birth weight recorded as well as mortality of pups within 48 hours of life. Results: A total of 54 pups was delivered, 77,80% of them recorded as vigorous by AS. Neonatal mortality was 11,1%. Lowest AS was assigned to pups from mothers receiving additional dose of PPF. AS was not influenced by birth weight of pups, nor by maternal and placental drugs concentrations. Maternal blood PPF (range 0,24-2,8- mcg/mL) and DEX (range 0,41-2,04 ng/mL), and placental PPF (range 0,24-2,57 mcg/mL) concentrations tended to decrease over time, while placental DEX (range 1,32-6,15 ng/mL) was fairly uniformly detected in pups from the same litter. DEX concentration in placenta was much higher than in maternal blood showing a greater placental retention compared with PPF. Both PPF and DEX were not detectable in amniotic fluid. Placenta resulted an effective barrier against fetal DEX exposure making this protocol safe, analgesic and advisable for elective C-section in dog.

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