Influence of delivery method on neonatal canine viability parameters

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While many important clinical parameters are used to asses viability, clinical outcome and pathology have been well-established in human neonates, foals, calves, and piglets; they are virtually unknown during the immediate postpartum period in the puppy. The aim of this study was to develop a database on neonatal puppies delivered via vaginal delivery, elective cesarean section, and emergency cesarean section and correlate the values with subjective assessment of viability. Preliminary studies involved 9 puppies from three litters that were born by natural vaginal delivery (Group A) and 3 puppies from one litter that were delivered by emergency cesarean section (Group B). Hematology samples were collected via venipuncture of the jugular vein. All samples were collected within 26 minutes of birth. Significant differences were noted between Group A and B in serum glucose concentrations (111±38 vs 54±17 mg/dl), blood urea nitrogen (22.8±5.1 vs 8.0±7.1 mg/dl), and pO2 (34.1±12.0 vs 53.7±18.2 mmHg). However, all values were within normal adult ranges. There were no significant differences between the rest of the measured values but the following trends were observed: APGAR scores and Doppler blood pressures were higher in Group A than B, while pCO2 and sO2 were higher in Group B than A. The ranges in serum glucose, sodium, chloride, lactate, HCO3, base excess, and sO2 were much wider in Group A than B while blood pressure ranges were wider in Group B. Lactate concentrations were higher, while pH and HCO3 levels were lower, in all puppies when compared to normal adults, indicating lactic acidosis and tissue hypoxia. There was no difference in the degree of lactic acidosis between Groups A and B and base excess was lower in all puppies. Interestingly, there was no correlation between lower APGAR scores and the degree of acidosis, blood glucose levels or any other parameter measured. In conclusion, significant differences in serum glucose, blood urea nitrogen and pO2 exist between puppies delivered via natural vaginal delivery and via emergency cesarean section. Furthermore, these results suggest that significant lactic acidosis is present in puppies immediately after birth, but that there is no significant difference in degree of acidosis

between puppies delivered via natural vaginal delivery and emergency cesarean section. However, the presence of acidosis in all puppies did not appear to impact viability as all puppies thrived past the neonatal period. Further studies will aim to expand the number of puppies assessed in Groups A and B, as well as include puppies from another group, planned cesarean section, and examine how long after birth lactic acidosis is present.

Keywords: Pediatrics, neonatal, dog, hypoxia, cesarean section