Coagulopathy in Pregnant Queens Undergoing Elective Ovariohysterectomies

Project title: Coagulopathy in Pregnant Queens Undergoing Elective Ovariohysterectomies
Organization: Hill Country Animal League
Project lead(s): Mack Fudge
Project completed: 12/31/19
Grant amount*:* $27,500
Project Type (Basic, Phase 1-4): Basic
Topics: Medicine, Surgery & Sterilization

Project Summary: This Hill Country Animal League study evaluated whether there is an increased risk of coagulopathy in pregnant cats that impacts their likelihood of survival during spay. The study included 236 cats that were grouped according to pregnant or non-pregnant status, and further broken down into six subgroups: not in heat, in heat, post-partum, early pregnant, mid-pregnant, or late pregnant. All the pregnancy subgroups were found to have much higher rates of bleeding than the overall incidence rate. Surgery (ovariohysterectomy) appeared to influence coagulation, with pregnancy appearing to increase hypercoagulability. Pregnant cats also broke down their clots faster.

The objective of the project was: This primary objective was to determine if there is increased risk of coagulopathy attributable to pregnancy in cats. A secondary objective was to characterize coagulation in pregnant cats subjected to spay surgery using a whole blood viscoelastic assay.

Methods: This study was a prospective, longitudinal, observational cohort study with two cross-sectional observations, one presurgical and one post-surgical. The cohort consisted of 236 cats presented for spay and an otherwise normal physical exam. Cats ≥2.75 kg body weight were sequentially entered into the study. Spay surgeries were done by a standard midline celiotomy by one of three surgeons, all well experienced (>3 years of experience and >7000 procedures each) in high volume spays in cats. Two blood samples were drawn, the first during pre-operation after the cat was anesthetized for surgical preparation. The second sample was collected 10 minutes after completion of surgery or at anesthesia recovery, whichever came first. All animals were sedated at the time of sample collection. Blood samples were compared between bleeders with blood loss greater than 10 mL, or postoperative hemorrhagic complications, versus non-bleeders and/or pregnant versus non-pregnant.

Results:

- Late pregnant cats had lower pre-surgical packed cell volumes (PCV) (33.1 $\pm$ 4.82) than non-pregnant cats not in heat (42.3 $\pm$ 5.12) and in heat (40.1 $\pm$ 7.20). There was also a trend for late pregnant cats to have a lower pre-surgical PCV than post-partum (38.0 $\pm$ 6.25), early pregnant (41.6 $\pm$ 7.37) and mid-pregnant cats (36.3 $\pm$ 4.38). Similarly, late

pregnant cats had a lower post-surgical PCV (27.6 ± 2.89) than cats not in heat and those in early pregnancy.

- There were no differences among groups with pre-surgical total solids. Post surgically, late pregnant cats' total solids (6.7 ± 0.53) were lower than those cats in middle pregnancy (7.5 ± 0.60) with a similar trend to be lower than cats in heat (7.2 ± 0.51).
- Results suggest that the best linear model does not result in a good approximation of coagulation parameters.
- Incidence of individual cats with excessive blood loss during surgery was more than double in pregnant than in non-pregnant cats.

Conclusions: Given that most of the results were within reference ranges, clinical significance could be questioned. However, it was clear that pregnant cats had a higher risk to bleed more than expected during surgery. Likewise, although pregnant cats formed strong clots, they broke down these clots at a faster rate. These two findings suggest that the surgery will likely be more stressful to pregnant cats and put them at a higher risk for postoperative bleeding complications than their non-pregnant counterparts. In combination, these observations show that spay surgeries in late term (and likely middle term) pregnant cats potentially has a higher risk of a significant rise in mortality. As such, consideration should be given to avoid this surgery, or delay it until after the pregnancy. If, however, the surgery is performed in these cats, greater care for mitigating these risks should be taken. Additionally, greater monitoring for complications should be done in these cats.

Tags: Coagulopathy, Spay, Pregnant, Queens, Ovariohysterectomy
Audience: Executive Leadership, Shelter/Rescue Staff & Volunteers, Public, Veterinary Team