Title:
Endogenous ACTH and cortisol secretion patterns in health and illness in horses and foals

Investigators:
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Study description:

Illness is accompanied by considerable stress. During periods of "appropriate stress" the brain releases a hormone called adrenocorticotropin (ACTH) that stimulates the release of cortisol from the adrenal gland, which in turn has many beneficial effects, principally, controlling inflammation and preventing shock. People that are critically ill often do not appropriately respond to the stress of infection. That is, despite stress-induced increased ACTH levels in the blood, these patients have inappropriately low blood cortisol levels, a diagnosis coined "relative adrenal insufficiency" (RAI). Survival in people and animals is substantially lower in patients with critical illness and RAI than in critically ill patients without evidence of RAI. The likelihood of death in people with severe illness and RAI can be significantly reduced if patients are supplemented with the synthetic cortisol product, hydrocortisone. However, at present we know very little about what causes the development of RAI during critical illness. In order to better understand how RAI develops during critical illness and to determine an appropriate dosing regime for hydrocortisone replacement therapy for use in horses and foals with RAI, we are currently investigating ACTH and cortisol production patterns during both health and illness in adult horses and foals.

10 sick adult horses will be enrolled if the following conditions are met:
- -2 years of age or older
- -Presenting for colic, fever or diarrhea
- -Clinical diagnosis of inflammatory intestinal disease (colitis, enteritis, enterocolitis)
- -Criteria for systemic inflammatory response syndrome (SIRS) met
- -Owner consent

10 sick foals will be enrolled if the following criteria are met:
- -1 to 5 days of age
- -Presenting for blood infection (sepsis); minimum sepsis score of 11 at admission
- -Owner consent

For both study populations, within 12 hours of admission 3ml of blood will be collected from a jugular catheter every 20 minutes for 12 hours for measurement of ACTH and cortisol concentrations. The study will pay for the cost of the blood testing.

Duration of study:

The study is ongoing until enrollment for each group has been met.

Potential benefits to veterinary medicine:

Ultimately this work will provide valuable information to increase understanding of mechanisms of hypothalamic-pituitary-adrenal (HPA) axis dysfunction during critical illness in horses and foals.