IMPACT OF ANESTHESIA, SKILL OF OPERATOR AND TIME ON SPAYING INDUCED STRESS IN DOG.

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INTRODUCTION

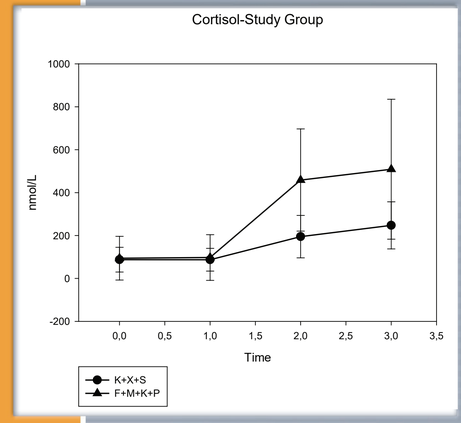
Surgical sterilization is used for population control of companion animals. Purpose of the operation is to produce healthy animals from healthy origin, just without sexual glands. However, our knowledge about events during the operation is limited, especially the effect of expert/untrained operator, anesthesia or time duration of intervention. Aim of our study was to validate the surgical stress and pain by measure of alteration of serum cortisol and insulin concentrations.

MATERIAL & METHOD

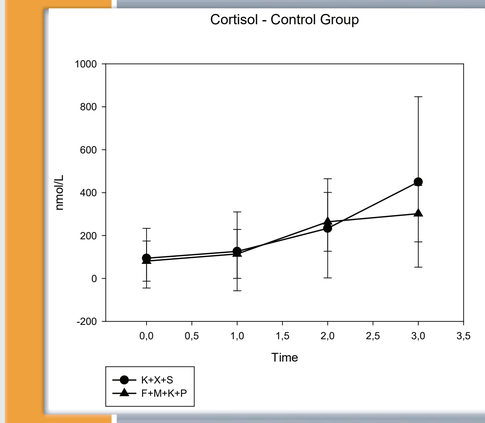
Twenty-two bitches were ovariectomized by surgeon with 25 years practice of operation (C) and 12 bitches by students supervised by expert surgeon at training of spay (ST). Serum samples were collected at moment of arrive to clinic, before start of anesthesia, after remove of second ovary and at just after last suture into the skin. Duration of steps is measured. Groups were divided in two. In group (Gr)-1 10 controls and 6 study dogs were anaesthetized by combination of Ketamine (10mg/kg) + Xylazine (2mg/kg) + Diazepam (1mg/kg) and maintained by Isoflurane inhalation, in Gr2 12 controls and 6 study dogs were anaesthetized by combination of Fentanyl (5µg/kg) + Midazolam (0.25mg/kg) + Ketamine (0.5 mg/kg) + Propofol (10mg/kg) and maintained with Fentanyl (0.25mg/5ml)/Ketamine (100mg/ml) infusion and Isoflurane inhalation. Serum cortisol concentration was measured by Cortisol EIA-1887 (DRG International), serum insulin concentration was measured by Canine Insulin 1203 (Mercodia). SigmaPlot program was used for statistical analysis.

RESULTS

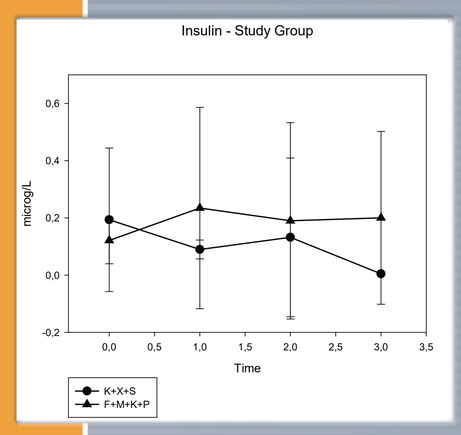
The mean duration of preparation was the same in each group (C:20.30min; St:19.20min), same, well-trained assistants managed it. The mean duration of operation was longer in ST group (C:18.30min; St:30.30min). The mean basal cortisol concentration was same in each group, C-Gr1:110.22nmol/L; C-Gr2:97.57nmol/L; ST-Gr1:7.38nmol/L; ST-Gr2:95.83nmol/L. The fastest and highest cortisol elevation was measured in ST-Gr2, where mean cortisol concentration just after remove of second ovaries was 458.75 nmol/L in contrast with ST-Gr1:194.67nmol/L; C-Gr1:233.47nmol/L; C-Gr2:263.73nmol/L. The final cortisol concentration was lower in C-Gr2:301.87nmol/L and ST-Gr1:247.39nmol/L, while the final level was C-Gr1:449.73nmol/L and ST-Gr2:509.07nmol/L. Serum starting insulin concentrations were same which decreased in C-Gr1:0.029µg/L and ST-Gr1:0.004µg/L at level of significance. Negative correlation was observed in each group between cortisol and insulin concentrations.



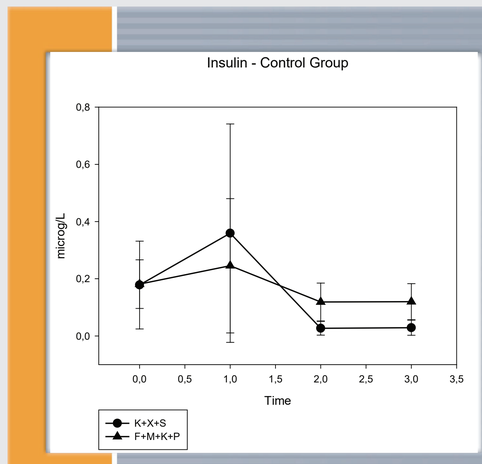
Serum cortisol concentration start to increase sharply after start of operation in dogs operated by students and anaesthetized by Fentanyl combination.



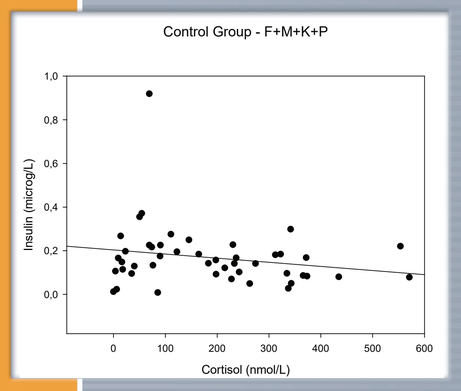
Serum cortisol concentrations of dogs operated by expert surgeon increase similarly in both anaesthetic groups.



Serum insulin concentrations in dogs operated by students .



Serum insulin concentrations in dogs operated by expert surgeon decrease strongly in group anaesthetized with Ketamine combination.



Negative correlation was the strongest in dogs operated by expert surgeon and anesthetized with Fentanyl combination

DISCUSSION

Excess of stress cannot be excluded from consequences of operations but type of anesthesia and expert operator should limit it. However, the duration of operation alone is not enough to decrease the pain of patient. The interference of duration of preparation, operation, the metabolism of anesthetics and the skill of operator result collectively the operation stress which factors cannot be standardized.

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