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MEASUREMENT OF TISSUE OXYGEN SATURATION DURING OVARI-OHYSTERECTOMY IN DOMESTIC FELINES WITH NEAR-INFRARED SPECTROSCOPY (NIRS)

Near-infrared spectroscopy (NIRS) is a noninvasive and continuous technique, easily and quickly to apply, that gives information in real-time of regional tissue oxygen saturation at microcirculation level. NIRS technique has proven to be an early indicator of organ ischaemia and oxygenation changes, when compared to other methods such as pulse oximetry, lactate and mental status. The objective of this study is to determine the NIRS range values in the caudal portion of the sartorius muscle in domestic female cats, during ovariohysterectomy. It will also be studied if NIRS is able to detect noxious stimulation, and to determine if NIRS values correlate to the physiological variables recorded during the surgical procedures in the same group of cats.

This preliminary study evaluated NIRS technique using the O3[™] Regional Oximetry device on sartorius muscle of six female cats, under general anesthesia and submitted to elective ovariohysterectomy. The haemodynamic and ventilatory data was recorded using the Mindray BeneView T8 monitor (Mindray Medical International Co., Ltd., Shenzhen, China). Pearson's correlation analysis was used to compare NIRS regional oxygen saturation (rSO2) values with the physiologic variable recorded. NIRS (rSO2) values were also compared at each surgical moment using Kruskal-Wallis analysis of variance. Statistical significance was defined when p-value<0.05. Data are mean±SD. Statistical analysis was performed using SPSS version 25 software.

The tissue oxygen saturation values obtained were 71.84±4.85% (65% to 83%), with cut-off 62%. Tissue hypoperfusion should be considered when sartorius NIRS values drop below 62% (two standard deviations below NIRS mean) during general anaesthesia in cats. Statistical significance was observed with a positive correlation between NIRS and minimum alveolar concentration, heart rate, and systolic blood pressure, reflecting the influence of the haemodynamic variables in the sartorius NIRS monitoring values. On the other hand, the negative correlation observed between NIRS and body temperature is interesting because, the haemodynamic changes induced by decreasing temperature values, also reflect a decrease in the metabolic state of the tissue. Which allows us to hypothesize that NIRS technology may have the potential of addressing the tissues' metabolic state. NIRS was not able to detect noxious stimulation in this study.

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