

# Monitoring Hemodynamic and Ventilatory Parameters During Carbon Dioxide Insufflation of the Peritoneum During Laparoscopy

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**Introduction and Objectives:** Laparoscopic surgery in veterinary medicine is experiencing a significant increase. While this technique offers numerous benefits, it also poses cardiorespiratory risks. This study aims to investigate the associated cardiopulmonary risks during laparoscopic anesthesia.

**Materials and methods:** Data were collected from the anesthesia monitoring of 10 dogs undergoing any elective laparoscopy with intraperitoneal insufflation, ventilated mechanically in volume mode ( $V_T$ : 10 ml kg<sup>-1</sup>; I:E: 1:2; PEEP: 4 cmH<sub>2</sub>O; *f<sub>r</sub>* adjusted according to the animal's needs). A uniform anesthetic protocol included dexmedetomidine (2.5 µg kg<sup>-1</sup>) and methadone (0.3 mg kg<sup>-1</sup>) for premedication, propofol (2 - 4 mg kg<sup>-1</sup>) for induction, and isoflurane (1 – 2 %) for maintenance with a FIO<sub>2</sub> of 50 %. Monitoring occurred at five Insufflation Pressure (IP) points (mmHg) in this order (0, 14, 10, 6, and desufflation to 0), with each period lasting 5 minutes. Hemodynamic (HR and non-invasive blood pressure) and ventilation variables (S<sub>P</sub>O<sub>2</sub>, ETCO<sub>2</sub>, Peak Inspiratory Pressure (PIP), Plateau Pressure (PP), Airway Resistance (AR), and compliance) were recorded. The Friedman test was used to compare the parameters.

**Results:** Ventilation variables showed significant changes with higher IP's compared to baseline values (PP (11,4 ± 0,4); PIP (11,9 ± 0,4); AR (20,4 ± 2,9); Compliance (26,4 ± 5,4); ETCO<sub>2</sub> (43,5 ± 1,6)). At IP 14, PP (16,3 ± 0,7), PIP (16,9 ± 0,7), AR (32,4 ± 7,6), Compliance (17,1 ± 4,1); at IP 10, PP (14,1 ± 0,2), PIP (14,5 ± 0,5), Compliance (19,6 ± 4,5) and at IP 6, ETCO<sub>2</sub> (48,5 ± 1,8). Hemodynamic alterations at different inflation pressures were not statistically significant.

**Conclusions:** These findings suggest that hemodynamic variables may not be concern at the specified insufflation pressures. However, it is crucial to consider respiratory changes, especially with higher insufflation pressures during laparoscopy. It is important to acknowledge the limited sample size and its potential impact on the conclusions.