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The effect of experimentally induced carbon dioxide pneumoperitoneum on intra-abdominal and intra-esophageal pH

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
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Abstract: Aim: An experimental study was performed to evaluate the effect of CO₂ pneumoperitoneum on intra-abdominal (IA) and intra-esophageal (IE) pH. Material and methods: The study included 18 Wistar rats. In the control group (n = 6) a pH catheter was inserted into the peritoneal cavity via a left upper quadrant incision and another catheter was inserted into the lower esophagus via the oral route. Pre- and post-insufflation IA and IE pH were recorded every 5 min for 1 h. In the experimental groups, in addition to pH catheters, a 16-G catheter was inserted into the abdomen above the umbilicus. In the O₂ group (n = 6) 95% O₂ and 5% CO₂ were insufflated with a pressure of 10 mmHg. In the CO₂ group (n = 6), CO₂ was insufflated with the same pressure and duration. Results: In the CO₂ group, IA and IE pH values significantly decreased (P < 0.05). IA pH values decreased in the CO₂ group when compared to the control and O₂ groups (P < 0.05). There was not a significant difference in IE pH between the CO₂ group and the other groups. Conclusion: CO₂ insufflation decreased IA pH values. Decreased pH values obtained with continuous recordings of the esophagus may have been related to increases in intra-abdominal pressure, rather than the metabolic effects of CO₂ pneumoperitoneum.

Key words: Carbon dioxide, pH, pneumoperitoneum, esophagus, abdomen

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