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Topic : Peritoneal physiology

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Metabolic consequences of oxygen added to the CO₂ pneumoperitoneum and types of ventilation during
laparoscopic surgery

CO₂-pneumoperitoneum causes acidemia, respiratory and metabolic acidosis. The addition of O₂ to the
CO₂ strongly reduces these effects. Here we wanted to define the consequences of O₂ addition to the
CO₂-pneumoperitoneum with different insufflation pressures in fixed and hyperventilated animal models.

CO₂ pneumoperitoneum created at intraperitoneal pressures (IPP) 10, 15 and 20 mmHg without and with
2% or 6% of oxygen, either low-fixed or high-hyperventilated 24 rabbits. Arterial blood gases (BG), acid
base balance (ABB), oxygen and lactate parameters were assayed every 15 min in 120 min.

All BG, ABB and metabolic parameters increased with elevated IPP. These changes were severe when
ventilation was fixed and disturbances were less pronounced when 2 or 6% of oxygen was added. The
IPP, amount of oxygen and ventilation were found to be independent variables affecting BG, ABB, O₂
values.

Absorption of CO₂ from the abdominal cavity increases with the IPP. The addition of small amounts of
oxygen to the CO₂-pneumoperitoneum reduces the metabolic consequences there off. It is suggested that
this is due to the prevention of metabolic and local tissue hypoxemia during CO₂-pneumoperitoneum.