Short and long term consequences of CO2 pneumoperitoneum impact on children’s health

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We read with great interest the article by Kılınç et al. (1) and we congratulate the authors for a well-designed prospective, observational study. The authors perioperatively monitored the regional splanchnic saturation (rSPcO2), regional cerebral oxygen saturation (rScO2), peripheral oxygen saturation (SPO2), end-tidal CO2 (Et-CO2), heart rate (HR), mean arterial pressure (MAP), and CO2 insufflation pressure (IP) during laparoscopic surgery in children. An increased Et-CO2 was associated with decreased regional oxygen saturation parameters (rSPcO2 and rScO2) during laparoscopic surgery with CO2 pneumoperitoneum. We also observed analogously increased Et-CO2 in children during laparoscopic surgery [2] associated with slight blood gas values and acid-base balance changes, associated with decreased skin temperature and urine output. We also found increased concentrations of pCO2 in the carotid venous and peripheral ear arterial blood with increased venous-to-arterial differences of CO2 tension with lower pH and tissue acidosis during CO2 pneumoperitoneum in the rabbit model [3].

These experimental results are certainly meaningful for pediatric surgery as there is a correlation among this model to physiological changes in children and therefore decreased regional oxygen saturation might be associated with increased CO2 concentrations with lower pH and tissue acidosis in these
regions. We believe that such decreased regional oxygen saturation in different locations is an important outcome of this study [1] and all these changes are the only short-term impact of CO₂ pneumoperitoneum. Possible future consequences of decreased cerebral oxygen saturation and tissue acidosis might influence postoperative cognitive function [4]. Risk factors of this condition in relation to laparoscopic surgery and general anesthesia have been extensively studied [5-7]. Short-term changes related to CO₂ pneumoperitoneum during laparoscopic surgery are well documented these days although its long-term consequences remaining unknown. Children and adults are vulnerable to post-surgical complications. It is very difficult to learn the postoperative cognitive function in pediatric patients, therefore further observations of children after such surgical treatment are needed to study the long-term consequences of CO₂ pneumoperitoneum and general anesthesia.

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LETTER TO EDITOR

