

## Studies which are not well designed produces misleading results concerning the CO<sub>2</sub> pneumoperitoneum impact on postsurgical ovarian function

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Response to: Qin J, Song G, Jiang Y, Liu Q, Lin H. Low-pressure pneumoperitoneum reduces influence on ovarian hormones in infertile women: a randomised trial. *Ann Palliat Med* 2021;10:5746-53.

Submitted May 31, 2021. Accepted for publication Jun 18, 2021.

doi: 10.21037/apm-21-1451

View this article at: <https://dx.doi.org/10.21037/apm-21-1451>

We read with great interest the article by Qin *et al.* (1). because the physiological aspects of pneumoperitoneum belong to our research subjects (2,3). Although we congratulate the authors for the randomized trial, it seems that their study design and results are raising several questions. The authors studied postsurgical complications, ovarian function (mean ovarian volume, maximal ovarian volume, mean follicle number, and maximal follicle diameter), the levels of serum sex hormone (estradiol, progesterone, testosterone), and gonadotropins (luteinizing hormone, follicle-stimulating hormone) as the outcome of four different CO<sub>2</sub> pneumoperitoneum pressures during laparoscopic surgery.

In their study profile (Figure 1) the authors divided their study population into four groups, where group A was operated with the intra-abdominal of 10 mmHg, whereas all other three groups with 11–12 mmHg pressure. However, they report increased pressure in groups C (13–14 mmHg) and D (15–16 mmHg) in the description of their methods. It seems that more traumatic surgical procedures with significantly longer operation time (94.55±11.7 min) and prolonged adhesiolysis manipulations

due to a higher rate of intra-operative adhesions (37.5%) were observed in group D when compared to the other groups (A–C). We believe that higher surgical trauma could overrule any CO<sub>2</sub> pneumoperitoneum impact on postsurgical pituitary and ovarian hormonal functions. Long-lasting surgical procedures in the pelvis (group D) might produce a more pronounced acute inflammatory reaction in the peritoneal cavity with cascade activation of signaling pathways and immune response. Subsequently, therefore, increased levels of pituitary hormones as a reaction to this activated higher inflammatory reaction in patients with the acute severe inflammatory reaction. There are well well-known interactions of inflammation with gonadotropins (4) and also the acute immune reaction and pro-inflammatory cytokines with ovarian hormones, especially with estradiol (5). Transitory changes in blood gases and acid-base parameters during CO<sub>2</sub> pneumoperitoneum evaporate simultaneously with decreased pneumoperitoneum pressure (2,3,6) and its impact is less pronounced than the tissue inflammatory reaction after surgical procedures (6,7). We suggest that the design of this study produces misleading results of CO<sub>2</sub>

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pneumoperitoneum impact on postsurgical pituitary and ovarian function.

## Acknowledgments

*Funding:* None.

## Footnote

*Provenance and Peer Review:* This article was a standard submission to the journal. The article did not undergo external peer review.

*Conflict of Interest:* All authors have completed the ICMJE uniform disclosure form (available at <https://dx.doi.org/10.21037/apm-21-1451>). The authors have no conflicts of interest to declare.

*Ethical Statement:* The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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**Cite this article as:** Mynbaev OA, Baimaganbetov AK, Tinelli A, Stark M. Studies which are not well designed produces misleading results concerning the CO<sub>2</sub> pneumoperitoneum impact on postsurgical ovarian function. *Ann Palliat Med* 2021. doi: 10.21037/apm-21-1451

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