

CORRESPONDENCE



# Concern for meta-analysis combining randomized parallel and cross-over trials

Wan-Jie Gu\*

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I read the recent meta-analysis by Songsangvorn et al. on electrical impedance tomography-guided positive end-expiratory pressure (PEEP) titration in acute respiratory distress syndrome (ARDS) with great interest [1]. While I commend the authors for their excellent work, I have some concerns regarding the meta-analysis.

Firstly, most randomized controlled trials typically involve patients being randomized into two or more parallel treatment groups. However, in a crossover trial, patients receive two-period treatments. One particular concern with the crossover design is the risk of a carryover effect, where the treatment effects from the first period persist into the second period [2]. Among the 13 studies included in this meta-analysis, one was a randomized crossover trial that did not incorporate a washout phase, potentially increasing the risk of a carryover effect [3]. In this meta-analysis, the authors did not mention how they handled data from this crossover trial. I suggest conducting a sensitivity analysis by excluding this crossover trial to assess the robustness of their conclusions.

Secondly, while nonrandomized studies should not be disregarded when addressing clinical questions in meta-analyses, it is important to note that nonrandomized studies tend to show larger treatment effects [4], as observed in the current meta-analysis. With a more cautious interpretation, the conclusions could be as follows: contrary to findings from randomized trials, evidence from observational studies suggests that electrical impedance tomography facilitates real-time,

individualized PEEP adjustments, improving respiratory system mechanics.

Lastly, by the way, the outcomes of respiratory system mechanics measurements lack units, including lung compliance (ml/cmH<sub>2</sub>O), mechanical power (J/min), driving pressure (cmH<sub>2</sub>O), plateau pressure (cmH<sub>2</sub>O), and PEEP level (cmH<sub>2</sub>O).

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#### Data availability

Not applicable.

#### Declarations

#### Conflicts of interest

None.

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\*Correspondence: wanjiegu@hotmail.com

Department of Intensive Care Unit, The First Affiliated Hospital of Jinan University, 613 Huangpu Avenue West, Guangzhou 510630, Guangdong Province, China

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