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Risk of aerosol formation by high flow nasal cannula treatment in critically-ill patients

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Neuromuscular blocking agents for ARDS: firm evidence for ICU mortality but not for long-term mortality

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Dear Editor,

Optimal ventilation and weaning strategies in patients with acute respiratory distress syndrome (ARDS) should be carefully assessed [1,2]. We applaud the systematic review by Torbic et al aiming to evaluate mortality when using neuromuscular blocking agents (NMBAs) in early, moderate-to severe ARDS compared to usual care or placebo. [3]. The authors, included 6 randomized controlled trials (RCTs), but only 2 out of the 6 RCTs had a low risk of bias [3]. We applaud the effort of the authors, but we have some concerns.

First, the fragility index, an intuitive measure of the robustness of RCTs, was introduced in critical care medicine and has been added in different systematic reviews [4-6]. Fragility index was achieved by using a two-by-two contingency table and p-value produced by Fisher exact test [4]. We calculated the fragility index of RCTs included in the systematic review by Torbic et al [3] and we found that all the included studies had a fragility index of zero ($p > 0.05$). According to this, the RCTs evaluating mortality when using neuromuscular blocking agents (NMBAs) in early and moderate-to severe ARDS are very fragile and even the evidence from these studies are very weak.

Second, the authors found that the use of NMBA reduced the risk for intensive care unit (ICU) and 21-28 day mortality but not 90-day mortality. According to these results, we further performed a trial sequential analysis to evaluate if this meta-analysis had sufficient statistical power to detect or reject the intervention effects [7]. For ICU mortality, the trial sequential analysis adjusted 95% CI ranged from 0.41 to 0.8 and showed that 431 out of 433 patients were enough to reach the required information size. According to this, firm evidence existed in favor of the use of the NMBA to reduce the ICU mortality. For 21-28 days mortality the trial sequential analysis was not conclusive, since the inclusion of 1485 patients were far short of the required sample size of 18,618 patients to make conclusive evidence. By evaluating the robustness of RCTs and trial sequential analysis , our analysis sustained the effects of NMBA to reduce the ICU mortality but not the 21-28 day and 90-day mortality. We believe we would need 18,470 moderate-to-severe ARDS patients treated with NMBA to reach firm evidence on long-term mortality.

References

1. Pelosi P, Vargas M: Mechanical ventilation and intraabdominal hypertension: 'Beyond Good and Evil'. Critical Care 2012, 16:187.
2. Manganelli F, Vargas M, Iovino A, Iacovazzo C, Santoro L, Servillo G. Brainstem involvement and respiratory failure in COVID-19. Neurol Sci. 2020;41(7):1663-1665.
3. Torbic H, Krishnan S, Harnegie MP, Duggal A. Neuromuscular Blocking Agents for ARDS: A Systematic Review and Meta-Analysis. Respir Care. 2021;66(1):120-128.
4. Vargas M, Servillo G. The End of Corticosteroid in Sepsis: Fragile Results From Fragile Trials. Crit Care Med 2018 46:e1228
5. Vargas M, Servillo G. Liberal versus conservative oxygen therapy in critically ill patients: using the fragility index to determine robust results. Crit Care 2019;23:132
6. Vargas M, Buonanno P, Iacovazzo C, Servillo G. Epinephrine for out of hospital cardiac arrest: A systematic review and meta-analysis of randomized controlled trials [published correction appears in Resuscitation. 2019 Dec;145:R1]. Resuscitation. 2019;136:54-6
7. Wetterslev J, Jakobsen JC, Gluud C. Trial Sequential Analysis in systematic reviews with meta-analysis. BMC Med Res Methodol. 2017;17(1):39