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Influence of ventilatory strategy on the PRESERVE mortality risk score: response to Camporota et al.

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Dear Editor,
We thank Dr. Camporota et al. [1] for their interest in our study [2]. We fully agree that the ventilation strategy, especially positive end expiratory pressure (PEEP) setting, is relevant to the validity and applicability of the PRESERVE score. PEEP was adjusted before extracorporeal membrane oxygenation (ECMO) initiation according to the high recruitment arm of the Express trial [3] in our study, targeting plateau pressure (Pplat) of less than 30 cmH₂O. This is the reason why PEEP was only 8 cmH₂O on average while FiO₂ was 1.0 and tidal volume (V_T) 6 ml/kg for non-survivors who had the lowest lung compliance (16 ml/cmH₂O on average before ECMO initiation). Using these mechanical ventilation settings and with a mean respiratory rate of 30/min, mean values for Pplat, pH and PCO₂ were 34 cmH₂O, 7.22 and 70 mmHg, respectively. Although ARDSNet protocols recommended PEEP up to 20–24 cmH₂O for FiO₂ = 1.0, they also recommended to keep Pplat no greater than 30 cmH₂O. Therefore, considering the extreme severity of these patients, it appears unlikely that applying the ARDSNet strategy might have

resulted in significantly higher PEEP, unless Pplat greater than 40–45 cmH₂O had been tolerated.

We concur with Dr. Camporota et al. that obese patients have lower transpulmonary pressure for the same Pplat, which might be associated with lower effective PEEP. In our multivariate analysis, BMI greater than 30 kg/m² was associated with better outcomes, independently of pre-ECMO plateau pressure and PEEP. Whether this “protective” effect of higher BMI was related to lower transpulmonary pressures or to an intrinsic survival benefit for obese patients as previously reported will remain speculative.

Our cohort does not permit a reliable sensitivity analysis according to H1N1 status because only 26 % of our patients had flu-associated ARDS. In a previous report by the REVA Research Network in France [4], multivariable analysis retained higher age, lactate and plateau pressure under ECMO as significantly associated with ICU death. Validation of the PRESERVE score on specific ARDS populations should be the focus of future studies.

Lastly, both SAPS II and SOFA scores were significantly associated with mortality. Since these two variables were collinear, only SAPS II was entered in the first multivariable model. However, SOFA score was preferred over SAPS II for simpler construction of the score at the bedside. Interestingly, the same threshold (SOFA > 12) was recently used by Roch et al. [5] to evaluate the risk of death in ARDS patients considered for retrieval under ECMO from distant hospitals.

Conflicts of interest Professor Combes is the primary investigator of the EOLIA trial, NCT01470703, a randomized trial of VV-ECMO supported in part by MAQUET. Professor Combes has received honoraria for lectures by MAQUET.

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