Competing Interests

The authors declare no competing interests.

Olivier Moreault, M.D., Yves Lacasse, M.D., F.R.C.P.C., Jean S. Bussières, M.D., F.R.C.P.C. Institut universitaire de cardiologie et de pneumologie de Québec - Université Laval, Québec City, Québec, Canada (J.S.B.). jbuss@criucpq.ulaval.ca

References

1. Hedenstierna G, Edmark L: Protective ventilation during anesthesia: Is it meaningful? Anesthesiology 2016; 125:1079–82
2. Brassard CL, Lohser J, Donati F, Bussières JS: Step-by-step clinical management of one-lung ventilation: Continuing professional development. Can J Anaesth 2014; 61:1103–21
3. Lohser J, Slinger P: Lung injury after one-lung ventilation: A review of the pathophysiologic mechanisms affecting the ventilated and the collapsed lung. Anesth Analg 2015; 121:302–18
4. Acute Respiratory Distress Syndrome Network. Ventilation with lower tidal volumes as compared with traditional tidal volumes for acute lung injury and the acute respiratory distress syndrome. N Engl J Med 2000; 342:1301–8
5. Moreault O, Lacasse Y, Bussières J: Body mass index chart 2016. Available at: http://bit.ly/2ikOtch. Accessed March 31, 2017

(Accepted for publication April 8, 2017.)

In Reply:

We appreciate the important comment by Moreault *et al.* on our article, "Protective Ventilation during Anesthesia: Is It Meaningful?"[1] We agree fully with the opinion that a low tidal volume should be based on ideal body weight to avoid harmful stress and strain to the lungs during anesthesia. This is even more important during one-lung ventilation. Ideally, the tidal volume should be adjusted to the size of the ventilated lung, but without a simple recording of lung volume, ideal body weight is a reasonable alternative. However, we also believe that an appropriate positive end-expiratory pressure is a prerequisite when using a low tidal volume, whatever the calculation method of ideal body weight. We find the method proposed by the authors commendable and indeed easy to remember as most anesthesiologists already are familiar with the method for calculating body mass index.

Competing Interests

The authors declare no competing interests.

Göran Hedenstierna, M.D., Ph.D., Lennart Edmark, M.D., Ph.D. Uppsala University, Sweden (G.H.). goran.hedenstierna@medsci.uu.se

References

1. Hedenstierna G, Edmark L: Protective ventilation during anesthesia: Is it meaningful? Anesthesiology 2016; 125:1079–82

(Accepted for publication April 8, 2017.)

Evaluation of Nitrous Oxide in the Gas Mixture for Anesthesia II (ENIGMA II) Revisited: Patients Still Vomiting

To the Editor:

We read the secondary analysis of the Evaluation of Nitrous Oxide in the Gas Mixture for Anesthesia II (ENIGMA II) trial for severe postoperative nausea and vomiting (PONV) with great interest.[1] Because PONV remains an often-cited risk in using nitrous oxide,[2] the investigation of methods to mitigate PONV using existing data generated from randomized controlled trials is an important undertaking. We wish to respond to this thorough reanalysis.

The authors used a retrospective propensity score approach to investigate the effects of antiemetic prophylaxis on the nitrous oxide and non-nitrous oxide arms. The well-recognized limitations of this approach were openly acknowledged in the publication, including the inability to control for hidden covariates and the need to truncate available data.[3] In the abstract, the authors conclude that the emetogenic effects of nitrous oxide are near eliminated by the addition of antiemetics. However, the results from the propensity score-matched analysis do not seem to support this conclusion, as the nitrous/antiemetic group had statistically higher odds of PONV compared with the nonnitrous/nonantiemetic group. In addition, administration of antiemetic prophylaxis among participants who did not receive nitrous oxide counterintuitively increased the odds of PONV. Although various clinical and scientific reasons may be hypothesized to explain this phenomenon, perhaps the simplest hypothesis is the presence of hidden covariates. Therefore, it is our opinion that the conclusion of negating PONV with antiemetics when nitrous is used is not supported by the results of this retrospective analysis, and the use of propensity score matching in this instance may not have resulted in a balanced comparison.

In light of the aforementioned results, another statistic (risk ratio, 0.74 [95% CI, 0.63 to 0.84]; $P < 0.001$) is quoted in the report[1] to support the conclusion that PONV is not increased when antiemetics are used in conjunction with nitrous oxide. This risk ratio does not appear among the results generated by propensity score matching but appears to be the result of a subgroup analysis for the PONV outcome in the original ENIGMA II report for patients who received antiemetic prophylaxis.[4] However, the lack of blinding of attending anesthesiologists to treatment allocation may have introduced selection bias into antiemetic prophylaxis, a possibility supported by the statistically significant difference in antiemetic administration between the nitrous and non-nitrous arms. If selection bias were present in antiemetic administration, the efficacy of this originally randomized subgroup analysis to equalize hidden covariates may have been compromised.[5]

Although this secondary analysis[1] of antiemetic prophylaxis on PONV has important limitations, we believe that