lead one to disregard the need for preoxygenation, but this would lead to the trap that Perrow[5] warns against. Similarly, we believe that the low frequency of complications from residual paralysis (reintubation, respiratory distress, and pneumonia) leads to a sense of complacency, because we either do not see or do not recognize these complications, especially if, as with pneumonia, they manifest later. Finally, when we see something rarely, it is easy to equate low risk with no risk, to the point that when the adverse outcome does occur, we are convinced it must be from some other cause. However, when common causes are ruled out, uncommon causes become very likely. Although twitch monitors are not without their own limitations, we believe the routine confirmation of adequate strength before extubation, using a quantitative train-of-four ratio greater than 0.9 or sustained 5-s tetanus at 100 Hz, can reduce the risk of adverse events from residual neuromuscular blockade and should become a standard of care.

Competing Interests

The authors declare no competing interests.

Lawrence J. Caruso, M.D., Heather Reed, M.D., R. Victor Zhang, M.D., Ph.D. University of Florida College of Medicine, Gainesville, Florida (L.J.C.). lcaruso@anest.ufl.edu

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Science or Fiction? Risk of Postoperative Pneumonia with Neuromuscular Blockade

To the Editor:

We read with interest the study by Bulka *et al.*,[1] which suggested a higher risk of postoperative pneumonia (POP) after the use of neuromuscular blocking agents (NMBAs). We believe that there are inconsistencies and calculation errors that significantly change the results of their study. In the NMBA analysis, there were 38 POP cases among 1,455 patients from the 10,594 patients who received an NMBA during surgery, yielding a POP incidence rate of 2.6%. However, in the NMBA reversal analysis, these same 10,594 patients were split into two subgroups: 1,623 patients who did not receive reversal and 8,971 patients who were given neostigmine. To our surprise, the POP incidence rates are significantly higher in both subgroups, with 149 POP cases in the 1,320 patients (11.5%) who received NMBA without reversal and 70 POP cases in the 1,320 patients (5.3%) who received NMBA and were reversed with neostigmine. Because these two subgroups are from the same 10,594 patients in the NMBA group, we do not understand why the POP rates are so much higher in the two subgroups.

The authors are silent on this apparent discrepancy in POP incidences. We believe that this is due to calculation errors. In Table 2 of the article,[1] the POP incidence rates are presented as "Incidence per 10,000 person-days at risk" because each patient was followed for up to 30 days. There are four such values, 9.00, 5.22, 4.22, and 1.88, representing patients who received NMBA, those who did not receive any NMBA, those who received NMBA without reversal, and those who received NMBA with reversal, respectively. The last two numbers appear to be incorrect; we believe that they should be 42.2 (not 4.22) and 18.8 (not 1.88). Thus, the actual POP incidence rates are much higher in the two NMBA subgroups than that of the total NMBA group (42.2 and 18.8 compared with 9.00). These errors in data collection and calculation lead to invalid conclusions.

We also wonder about the study design, with its 30-day observation period. Although it has been suggested that many postoperative complications require a 30-day follow-up,[2] we do not think this applies to NMBA complications. Any postoperative residual neuromuscular blockade in these patients would be clinically insignificant in a matter of hours, and a POP related to that should easily be evident within 1 week. It would seem to be erroneous to attribute any POP cases that occurred several weeks after surgery to the use of NMBA.

Competing Interests

The authors declare no competing interests.

R. Victor Zhang, M.D., Ph.D., Heather Reed, M.D., Lawrence J. Caruso, M.D. University of Florida College of Medicine, Gainesville, Florida (R.V.Z.). rzhang@anest.ufl.edu

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