Revista Colombiana de Anestesiología
Colombian Journal of Anesthesiology
www.revcolanest.com.co

Editorial

# On neuromuscular blockers, safety and more☆

## Sobre bloqueadores neuromusculares, seguridad y algo más

*Fredy Ariza**

*MD, MSc, PhD(a), Department of Anesthesiology and Perioperative Medicine, Fundación Valle del Lili, Colombia*

It is not a secret that safety parameters for the use of neuromuscular blockers (NMB) have been a hot topic in recent years. The match that started the fire, first with the reports by Vibi-Mogensen et al.,[1] and followed three decades later by Debaene et al.,[2] showed unacceptable high rates (28–38%) of postoperative residual curarization (PORC), which are curently as prevalent as ever despite the use of NMBs with lower total recovery times than those used in the past.[3] Although the need for neuromuscular monitoring (NMM) has been advocated together with a conservative attitude regarding the dose and use of NMBs, the reality is different and people interpret the available evidence as they see fit.

However, those who have studied this topic have made it a point to sound the alarm regarding the persistence of repetitive events of PORC that go unnoticed and underdiagnosed, especially in public hospitals where intermediate and long-acting NMBs are used indiscriminately, even in outpatients. This fact is made evident by an observational study that will be published soon, conducted in a Colombian public hospital. This study showed that this problem remains almost unchanged and that the incidence of TOF <90% on arrival of the patients at the PACU remains virtually static (24–27%).[3] Fortunately, these drugs has gradually lost their marketing and, lack of opportunity more than true knowledge has caused hospitals turn their interest in other molecules backed by stronger marketing but less dangerous pharmacokinetics/pharmacodinamics and even more predictable.

In this issue of the Colombian Journal of Anesthesia (RCA) we have published two papers on the topic of safety and the use of NMBs. The first, by Reyes et al., assessed the clinical behavior of a NMB currently considered to have intermediate action at $2 \times DE_{95}$ in a small group of patients, most of them females. This study found wide variability in latency as well as full recovery[4]. Outside the methodological discussion of this study,[5] its results lead us to think about an extremely wide biological variability for this drug and the aminosteroid family of NMBs in general, which cannot be explained only on the basis of their pharmacokinetics. Physical and chemical characteristics such as electrical affinity and fat solubility, not to mention tissue hipo/reperfusion phenomena that are common during surgery, may cause trouble if we trust these drugs blindly. Consequently, it is critical to establish NMM as standard management possible from 15–20 min before removing ventilation support and reverting unconsciousness.

The second publication a review article by Fabregat López et al. that emphasizes the lack of a interest among the anesthetists despite the large number of reports on residual paralysis and the potential benefits of NMM.[6] It also offers an excellent illustration about the benefits and uses of NMM, the way to perform it, and again shows the little usefulness and danger of clinical assessment as the sole means to diagnose potential residual paralysis. Finally, the paper shows the different options for NMM, its benefits and disadvantages, and shows some strategies to lessen the odds of PORC.[7]

NMBs and adverse events related to their use will continue to be topics for discussion for many years, until the information derived from recent evidence reaches the anesthesia community at large and awareness regarding the need for

☆ Please cite this article as: Ariza F. Sobre bloqueadores neuromusculares, seguridad y algo más. Rev Colomb Anestesiol. 2012;40:249–50.

* *Corresponding author at*: Av. Simón Bolívar. Cra 98 # 18-49, Departamento de Anestesiología y Medicina Perioperatoria, Cali, Colombia.
E-mail address: fredyariza@hotmail.com

more frequent monitoring when they are used. This requires a widespread effort at procuring NMM equipment, which is not incumbent upon the pharmaceutical industry, considering that they have always offered them for clinical use, sometimes at no cost in Colombia. Many of us have responded to this "gift" with a misinterpretation of what it really means, using it only sporadically and infrequently, and perhaps only for confirming evident episodes of residual paralysis.

The time has come to rekindle our concern regarding the indiscriminate use of some so-called intermediate-acting NMBs, and even eradicate the permanent and repetitive use (with some exceptions) of single doses higher than $2 \times DE_{95}$, described for these drugs, regardless of their duration of action.[8] This is true in particular for outpatient services where quality goes hand in hand with the adequate and relevant use of resources. We must become accustomed to use these drugs in a more dynamic way, even if this means paying additional attention to their indication, dosing, monitoring and vigilance, starting with the practice of deciding whether they are really necessary for the procedure when there are other drugs like opioids and hypnotics that can replace them partially or even totally. We must also consider the rational and permanent use of neuromuscular[9] reversion, to ensure adequate perioperative clinical conditions that may help prevent related adverse events.[10]

Finally, I would like to highlight the indefatigable work of the Colombian group for the study of NMBs led by Drs. P. Pinzón and M. Naguib (well known for his publications in this area), and their constant education activities for Colombian and Latin-American anesthetists. We hope that the papers discussed in this editorial will serve as a frame of reference for new research that will result in a safer anesthesia practice: our patients deserve it. Our profession as a pionner in the field of safety deserve it.

## Funding

The author's own resources.

## Conflict of interest

None.

## REFERENCES

1. Viby-Mogensen J, Jørgensen BC, Ording H. Residual curarization in the recovery room. Anesthesiology. 1979;50:539–41.
2. Debaene B, Plaud B, Dilly MP, Donati F. Residual paralysis in the PACU after a single intubating dose of non-depolarizing muscle relaxant with an intermediate duration of action. Anesthesiology. 2003;98:1042–8.
3. Butterly A, Bittner EA, George E, Sandberg WS, Eikermann M, Schmidt U. Postoperative residual curarization from intermediate-acting neuromuscular blocking agents delays recovery room discharge. Br J Anaesth. 2010;105:304–9.
4. Reyes LE, et al. Variabilidad clínica del vecuronio. Experiencia en una institución en Colombia. Rev Colomb Anestesiol. 2012 http://dx.doi.org/10.1016/j.rca.2012.06.003
5. Kopman AF, Lien CA, Naguib M. Neuromuscular dose–response studies: determining sample size. Br J Anaesth. 2011;106:194–8.
6. Naguib M, Kopman A, Cynthia AL, Hunter J, Lopez A, Brull SJ. A survey of current management of neuromuscular block in the United States and Europe. Anesth Analg. 2010;111:110–9.
7. Fabregat López J, et al. La monitorización neuromuscular y su importancia en el uso de los bloqueantes neuromusculares. Rev Colomb Anestesiol. 2012;40:293–303.
8. Claudius C, Karacan H, Viby-Mogensen J. Prolonged residual paralysis after a single intubating dose of rocuronium. Br J Anaesth. 2007;99:514–7.
9. Sauer M, Stahn A, Soltesz S, Noeldge-Schomburg G, Mencke T. The influence of residual neuromuscular block on the incidence of critical respiratory events. A randomised, prospective, placebo-controlled trial. Eur J Anaesthesiol. 2011;28:842–8.
10. Murphy GS, Szokol JW, Marymount JH, Greenberg SB, Avram MJ, Vender JS. Residual neuromuscular blockade and critical respiratory events in the postanesthesia care unit. Anesth Analg. 2008;107:130–7.