

Toward A Consensus On The Use Of Neuromuscular Monitoring

Neuromuscular blockade (NMB) monitoring is mostly used in operating room, but also in Intensive care units (ICU) on patients in early phases of ARDS for sedation management, one amongst other indications. To evaluate NMB, we can either do it subjectively, by looking at the muscle contraction while stimulating the nerves with a neurostimulator, or having the patient do a 5-second head lift. There is qualitative TOF and There is also objective monitoring, by quantitatively measuring the train-of-four ratio (TOFr). In 2018, still Not everybody uses this monitor before extubating their patients. Recommendations are needed to standardize and provide a better care for patients.

A panel of clinician scientists with expertise in neuromuscular blockade published last year a “Consensus Statement on Perioperative Use of Neuromuscular Monitoring”. They gave recommendations and indications on proper use of the NSB monitors. They believe that whenever a neuromuscular blocker is administered, monitoring should be performed. Ideally, an objective monitor should be placed on the hand muscles. Here is a summary of their recommendations:

- 1.** “Quantitative (objective) NMB monitoring should be used whenever a nondepolarizing NMBD is administered”. Quantitative term is used for the measurement of the train-of-four ratio (TOFr). TOFr will be calculated by first measuring the magnitude, in percentage, of the four muscle twitches you get with a nerve stimulator. Then, divide the magnitude of the fourth twitch (T4) by the magnitude of the first one (T1). The ratio will be zero as soon as you monitor less than four twitches, as T4 will be 0. It is not meant to measure the depth of the paralysis, but to monitor more objectively an adequate recovery. If it is Qualitative, you can only say, there are 2 or 3 or 4 of 4 twitches, but not give a percentage.
- 2.** “Subjective or clinical tests of NMB are not predictive of adequate neuromuscular recovery “ and are not sensitive enough. Their use may lead to errors, as a TOFr cannot be detected precisely between 0,40 and 1, only by looking at the response. Therefore, clinicians may be lead to assume that the recovery is complete even if it is not. The TOFr that assures the readiness of tracheal extubation (0,90) should also be documented, and that can only be done with objective measurements.

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3. “Professional organizations should develop practice standards and guidelines detailing how best to monitor and manage perioperative administration of NMBDs.” The high incidence of residual NMB (40-60%) and its associated morbidity leads them to think that clinicians should monitor better this condition. Standardizing the management of this condition would bring a better control and help reduce the incidence.

4. “Terms that describe the levels of NMB should be standardized. This consensus statement provides proposed definitions of complete, deep, moderate, shallow, and minimal NMB based on quantitative NMB monitoring criteria”. This implies a lot of education in all work environment, as every hospital has its own practice. But if the monitoring of NMB is standardized with the tools that we have now, education will be the path to reduce the mortality related to residual NMB.

Neurostimulator are devices we should use everyday, and their use could be optimized. A good neurostimulator providing objective monitoring is a must for quality patient care.



References:

Nov 30, 2017 - **Consensus Statement on Perioperative Use of Neuromuscular Monitoring.** Naguib M, Brull SJ, Kopman AF, Hunter JM, Fülesdi B, Arkes HR, Elstein A, Todd MM, Johnson KB.