Monitoring Neuromuscular Function

To the Editor:—I have reviewed with interest the clinical report by Kopman.1 The study was designed to compare the conventional evoked mechanical twitch response (MMG) of the adductor pollicis brevis muscle (thumb adduction) with evoked integrated electromyogram (EMG) with the use of a new commercially available compact self-contained monitor (Datex® NMT 221) and train-of-four (T4) mode of stimulation. Dr. Kopman chose to use the hypothenar muscle (the abductor digiti quinti) to elicit its evoked integrated EMG in response to ulnar nerve stimulation and compared it with the mechanical response of the adductor pollicis brevis. Undoubtedly the data generated in this study are very helpful in delineating some reservation about the hypothenar EMG and its limitations as a predictor of the degree of evoked thumb adduction. Unfortunately, Dr. Kopman has left the reader to believe that this correlation applies to any other muscle that may be used to study evoked EMG. In the discussion, the author did not elaborate on the fact that he chose for the EMG studies a muscle different from that used for the tension measurements. This may have contributed to the discrepancies in the two methods of monitoring. Katz2 showed that the abductor digitii quinti (hypothenar EMG) is different from the adductor pollicis brevis (thenar EMG). The latter muscle is more sensitive to d-tubocurarine, or the thenar EMG is more depressed than the hypothenar EMG. In a recent study in our department (unpublished data), we found a significant correlation between the measurements of evoked thumb adduction (MMG), the integrated EMG, and the peak-to-peak amplitude of the actual wave form of the compound action potential of the adductor pollicis brevis (thenar EMG). The discrepancy between the MMG and EMG of that same muscle was too minimal to be of any clinical significance.

The train-of-four count reported for d-tubocurarine does not quite apply to atracurium neuromuscular blockade. Atracurium does not show as much fade of the train-of-four (T4/T1) at any equivalent degree of depression of the first response of T4, when compared with other currently available nondepolarizing relaxants including vecuronium.3 In other words, after atracurium neuromuscular blockade, the fourth response to T4 stimulation generally appears when T1 (the first response) is <20–25% when compared with the control response.

Clearly, there is a clinical need for comparing conventional evoked thumb adduction with the EMG response of other accessible nerve–muscle preparations so that the anesthesiologist becomes aware of the limitations of each approach. More importantly, studies correlating these evoked EMG responses with criteria of satisfactory surgical relaxation and adequate clinical recovery from nondepolarizing relaxants are badly needed.

HASSAN H. ALI, M.D.
Associate Professor of Anaesthesia
Department of Anaesthesia
Massachusetts General Hospital
Boston, Massachusetts 02114

REFERENCES


(In accepted for publication November 4, 1983.)

Anesthesiology
64:532–533, 1986

In reply—I find myself in basic agreement with the comments of Dr. Ali. Measurement of the integrated electromyogram (EMG) response of the hypothenar muscles, however, was chosen for a specific reason. Just as the quality of the recorded mechanical twitch depends greatly on such factors as muscle preload and correct alignment of the transducer with the thumb, measurement of evoked EMG responses requires accurate placement of the recording electrodes.

The adductor pollicis through most of its course is not a superficial muscle. Dorsally, it is deep to the first interosseous muscle, and ventrally, it is deep to the flexor pollicis brevis...
CORRESPONDENCE

and the abductor polllicis brevis. Although EMG responses from the adductor polllicis may be obtained by ventral placement of a surface electrode just distal to the thenar eminence and over the second metacarpal, we believed that the precise placement required for accurate measurements necessitates an attention to detail that may be unrealistic to expect from the casual or infrequent user of this technique. The belly of the hypothenar eminence, on the other hand, is a well-defined “target” and allows a much wider margin for error in electrode placement.

The point Dr. Ali makes regarding the need for additional work to correlate the hypothenar EMG response to mechanical respiratory reserve is, I believe, extremely important.

AARON F. KOPMAN, M.D.
Attending Anesthesiologist
Long Island Jewish Medical Center
New Hyde Park, New York 11042
(Accepted for publication November 4, 1985.)

Nitroglycerin Improves Venous Cannulation

To the Editor:—I wish to call to the attention of my colleagues a useful adjunct to the placement of intravenous catheters. Many patients admitted to hospitals require some form of intravenous therapy but have poorly visible veins. Often the veins of such patients have been traumatized by multiple attempts and failures by hospital staff.

I have found that these veins are easily visualized by placing ¼ inch (1.2 cm) of nitroglycerin ointment (Nitropaste®) over the dorsum of the hand or foot in the region selected for the site of cannulation. Before venopuncture, the ointment is removed with an alcohol swab. In all cases there has been an obvious increase in vein size and a resultant minimal difficulty with catheter placement. Hecker et al. have also reported that the use of nitroglycerin ointment reduced the difficulty of cannulation.1 However, these authors suggested a 2-hour interval between ointment administration and catheter placement, whereas a period of 10 to 20 min has been sufficient in my experience. Neither in their study nor in my experience at this institution have any adverse effects, including significant blood pressure changes, occurred.

In view of the speed of onset, simplicity, and increased efficiency that this maneuver allows, I recommend its use for those patients in whom intravenous catheter placement difficulties have occurred or are anticipated.

PATRICK L. MOORE, M.D.
Resident in Anesthesiology
Texas Tech Health Sciences Center
Lubbock, Texas 79430

REFERENCES

(Accepted for publication November 4, 1985.)

Seizure Following Stellate Ganglion Block after Negative Aspiration and Test Dose

To the Editor—Seizures during stellate ganglion block are a well-described complication,1 and even very small doses of local anesthetic, such as 1.5 ml of 0.5% bupivacaine, may cause seizures if injected directly into the vertebral or carotid artery.2 Recommendations to prevent the occurrence of seizures include careful attention to anatomic landmarks, aspiration tests in two planes, and the use of very small volumes of local anesthetic, such as 0.25–0.5 ml before injection of the therapeutic dose.3

We recently had a patient develop tonic–clonic seizure activity during stellate ganglion block despite negative aspiration tests and no apparent response to 0.5 ml of 0.5% bupivacaine given as a test dose. After the test dose, 60 s elapsed before we injected an additional 5 ml of 0.5%