

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 digiti 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 In a recent study in our department (unpublished data), we found a significant correlation between the measurements of evoked thumb adduction (MMG), the integrated EMG, and the peak-to-peak amplitude of the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.

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

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.

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REFERENCES

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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 interosseus and ventrally, it is deep to the flexor pollicis brevis