

**ONSET, DURATION AND RECOVERY OF
MIVACURIUM CHLORIDE (MIVACRON)
WHEN USED IN PATIENTS SUSPECTED TO
HAVE LOW LEVELS OF PLASMA
CHOLINESTERASE ENZYME**

THESIS

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بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ

In the Name of Allah, Most Gracious, Most Merciful

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ABSTRACT

Mivacurium chloride (mivacron), a bis-benzylisoquinolinium diester compound, new short acting non-depolarizing muscle relaxant, was found to undergo hydrolysis in vitro by purified human plasma cholinesterase enzyme at 70% to 80% of the rate of succinyl choline. In this study the neuromuscular blocking effect of mivacurium was assisted following bolus intubating dose of 0.2 mg/kg when used for patients developed low plasma cholinesterase (PCEH) enzyme activity as a result of their medical condition such as malignancy, burn, malnutrition or anaemia.

Forty consenting ASA physical status I - II patients receiving thiopentone fentanyl nitrous oxide/oxygen isoflurane anaesthesia were submitted for this study. Twenty of these patients represented group I (control group) had normal PCHE enzyme activity (mean value = 4299 IU/L) and the other 20 patients represented group II (test group) developed low PCHE enzyme activity (mean value = 3169.2 IU/L; 26.3% below the control mean value) as a result of their different medical conditions.

This study documented that, in spite of the fact that the blocking effect of mivacron depends on other factors than hydrolysis by PCHE enzyme such as distribution of relaxant from the plasma to the interstitial space and other mechanisms (metabolism in the liver or renal excretion), the deficiency in PCHE enzyme activity prolonged the duration of action and recovery from mivacron but did not affect significantly the onset time or the intubation criteria.

The duration of action (recovery of 25% of the receptors), the recovery index (recovery of the receptors from 25% to 75%) and the recovery time to 95% were prolonged significantly above the control mean values by 7.35 minutes (43.9%), 1.36 minutes (18.7%) and 7.805 minutes (27.35%) respectively. No significant effect was found on the recovery time from 95% to recovery of train of four to more than 70%.

Few cases developed side effects as a result of histamine release but there were no significant cardiovascular effects recorded. Reversal with prostigmine was satisfactory in the few cases needed reversal.

The results in this study indicated that very low plasma cholinesterase activity may be associated with prolonged neuromuscular blockade following a normal intubating dose of

mivacron and that a reduction in injected dose is likely to be necessary in these patients.

Key words: Non-depolarizing muscle relaxant, Mivacron, Intubating dose, Plasma cholinesterase enzyme activity, Duration time, Recovery index, Histamine, Prostigmine.

INTRODUCTION

