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Title : COMPARATIVE CUMULATIVE EFFECTS OF NORCURON AND PANCURONIUM

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Introduction. Norcuron is a new non-depolarizing muscle relaxant with a duration of action that is approximately one-third shorter than that of pancuronium. Therefore, Norcuron would need to be given repeatedly to provide adequate sustained relaxation for surgery. We compared the cumulative effects of Norcuron and pancuronium when given repetitively.

Methods. We obtained informed consent and approval from the Committee on Human Research to study 22 ASA I or II patients scheduled for surgery. Anesthesia was induced with thiopental, 100 to 150 mg iv, halothane, and nitrous oxide. The trachea was intubated without the use of muscle relaxants. Ventilation was controlled to keep $PaCO_2$ within normal range, and anesthesia was maintained with halothane, 0.4 to 1.0% end-tidal concentration, as measured by mass spectrometry. We assessed neuromuscular function by quantitating adduction of the thumb (Grass FT-10 force displacement transducer) in response to supramaximal stimulation of the ulnar nerve at the wrist. Norcuron was first administered in small incremental doses (0.01 to 0.02 mg/kg) until total loss of twitch tension was achieved. When twitch tension had returned to 25% of control, patients were divided into three groups and received 0.014, 0.02, or 0.04 mg/kg of Norcuron. The same dose was repeated every time twitch tension recovered to 25% of control. All patients received their designated dose at least three times. We measured the time from injection of a dose of Norcuron to recovery of 25% of control muscle twitch tension. The data from all patients in a dose group were combined and reported as a mean time of duration ± SEM for the first, second, etc., dose given. Seven additional patients were studied in a similar fashion, except that pancuronium at a dose of 0.02 mg/kg was given instead of Norcuron. Based on dose-response data previously obtained, this dose of pancuronium would be equivalent to 0.014 mg/kg of Norcuron.

Results. Results are presented in Figure 1.

Discussion. Our study confirms the data of Katz[1] and Norman,[2] who found that pancuronium had a marked cumulative effect. Using a dose of 0.02 mg/kg, we found an increase in duration of 139% between the first and fourth doses of pancuronium. In contrast, the increase in duration from the first to the fourth doses of Norcuron (0.014 mg/kg) was only 39%. We conclude that Norcuron not only has a much shorter duration of action, but also has a significantly less cumulative effect than does pancuronium.

References

1. Katz RL: Clinical neuromuscular pharmacology of pancuronium. Anesthesiology 34:550-556, 1971

2. Norman J, Katz RL, Seed RF: The neuromuscular blocking action of pancuronium in man during anaesthesia. Br J Anaesth 42:702-709, 1970

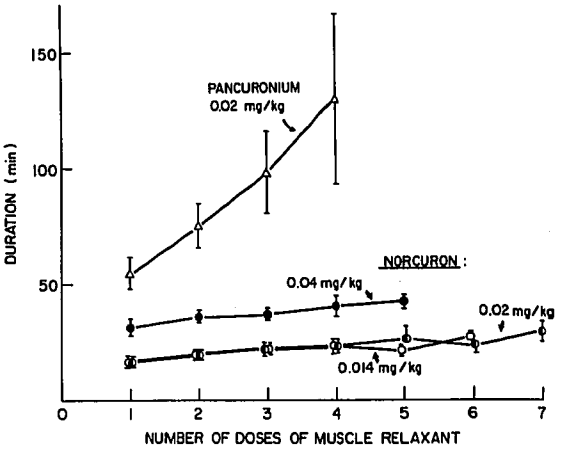

Fig. 1