

A STUDY OF THE USE OF ATRACURIUM IN MINOR AND MAJOR SURGERY

Pages with reference to book, From 41 To 42

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Abstract

Seventy patients were administered Atracurium, during six months from November, 1986 to April, 1987, for muscle relaxation during minor to major surgery. Age range was between 16-75 years with an average of 45. No premedication was used. Induction was with 2.5%, Sodium Pentothal and maintenance with gas, oxygen and halothane. Sixty one (87%) patients had good surgical relaxation. Two (2.85%) adequate and seven (10%) had poor relaxation. Major complications were bradycardia, eleven (15.7%) patients and bronchospasm (12.8%) nine patients. Sixty three (90%) had spontaneous recovery. Atracurium was found to be a safe muscle relaxant with an added advantage of elimination by Hoffman's reaction (JPMA 40: 41, 1990).

INTRODUCTION

Atracurium besylate is a nondepolarizing (competitive) neuromuscular blocking drug of short duration of action. It was introduced in general clinical practice in United Kingdom in 1983 and was developed and synthesized by J.B. Stenlake¹. It is a bis-guaternary ammonium. In 1851 Hoffman described a chemical reaction now known as the Hoffman's elimination whereby a guaternary ammonium compound could undergo spontaneous decomposition if the prevailing conditions were right². Stenlake's idea was to incorporate the concept of the Hoffman's elimination into the design of the structure of a new neuromuscular blocking agent. Its main metabolites are Iandanosine and guaternary monoacrylate³. Landanosine may further undergo an enzymic N-demethylation to tetrahydropapaverine. The degradation of atracurium is relatively short with an elimination half life in plasma of approximately twenty minutes. This study was carried out to see the efficacy and safety of this drug having produced a satisfactory relaxation.

MATERIAL AND METHODS

Seventy patients undergoing major or minor surgical procedures were included in this study. Dosage of atracurium used was between 0.4mg/kg to 0.6mg/kg. No premedication was used. All the patients were induced with 2.5% Sodium Pentathal 14mg/kg and 30-50mg Pethidine. They were maintained on minute volume of 6-10 litre with O₂/N₂O ratio of 50:50. Halotbane was added in concentration of 0.5 during the entire procedure. Ventilation was controlled on Manley Pulmovent MPT 2000 ventilator. All the patients had their EKG displayed continuously and B.P was monitored by Dinamap. Neuromuscular status was gauged with Bard 75 peripheral nerve stimulator.

RESULTS

Seventy patients, forty one males and twenty nine females were studied. Age ranged between 16-75 years with the mean of 45 years. The mean weight was 56.91 kg and the total duration of procedure was 20-270 minutes. Fifty two patients (74.2%) could be intubated in three minutes, fifteen (21.4%) in

four minutes, two (2.8%) in five minutes and one (1.4%) patient in seven minutes. Good surgical relaxation was seen in the majority of the patients. There was marked rise in mean arterial pressure and pulse rate after five minutes of injection of atracurium (Table I).

TABLE I. Showing cardiovascular effects of Atracurium 0.4mg/kg administered by rapid I.V. injection to seventy patients (mean).

	Time after traurium		
	Control	2Mins.	5Mins.
Heart rate (beat min)	83	90	99
Mean arterial pressure (mm Hq)	110	106	120
Systolic arterial pressure (mm Hg)	128	132	148
Diastolic arterial pressure (mm Hg)	81	80	91

Bradycardia was seen in eleven patients (Table II). Adverse reactions encountered were bronchospasm, cough, hiccup and sweating (Table II).

TABLE II. Adverse Effects.

		Treatment Required
Bradycardia	11 (15.7%) patients	8 had to be treated with atropine 1mg I.V.
Tachycardia	2 (2.8%) patients	No treatment required
Bronchospasm	9 (12.8%) patients	1 had to be treated with aminophylline 250mgI.V.
Cough	2 (2.8%) patients	No treatment required
Hiccup	1 (1.4%) patients	No treatment required
Sweating	3 (4.2%) patients	No treatment required

90% of the patients had spontaneous recovery and reversal was administered in five patients only.

DISCUSSION

Atracurium, a nondepolarizing muscle relaxant, has been in use since 1983. Different workers⁴ have documented the advantages of this muscle relaxant. As elimination is by Hoffman's reaction this drug is very safe for patients specially with renal and hepatic impairment. It shows excellent tendency towards spontaneous recovery of neuromuscular function without necessarily involving the need for a specific antidote. The reproducible rate of spontaneous recovery after atracurium has been noted by several investigators⁵ even in prolonged surgery. The adverse reactions were similar to Jones⁶ and most of them were reversible with adequate therapy. Rise of blood pressure in the first five minutes of injection is related to laryngeal stimulation during intubation and caused no significant side effects.

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