COMPARATIVE EFFECTS OF PANCURONIUM AND VECURONIUM ON COMPLEMENT C_3 AND C_4 IN PATIENTS UNDERGOING MINOR GYNAECOLOGICAL SURGERY

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In the present investigation, we studied the comparative effects of two muscle relaxants, pancuronium and vecuronium, on plasma complement components C_3 and C_4 in patients undergoing minor gynaecological surgery. The aim was to see if these drugs produced adverse reactions (Watkins 1986; Hunter 1987), stimulated complement-activated histamine release, and to see which of the two muscle relaxants produced the greater effects in these specific type of patients.

Twelve, adult, female patients, aged 22-72 years, weighing 53-106 kg, were used in a random manner. Each patient served as her own control. Informed consent was obtained from all patients and approval of local ethics committee was obtained. Anaesthesia was induced with propofol (2 $mg.kg^{-1}$, i.v.), an agent used for induction and maintenance of anaesthesia, following which there is a rapid recovery without a hangover. Anaesthesia was maintained with nitrous oxide and halothane. Neuromuscular blockade was achieved with pancuronium (0.1 $mg.kg^{-1}$) or vecuronium (0.1 $mg.kg^{-1}$), each drug was administered in a group of six patients. Blood samples were collected in EDTA, to prevent complement activation in vitro, 30 min before and at 10 min after surgical operation. Blood levels of C_3 and C_4 were measured using a rapid and sensitive method, the laser nephelometry (Vergani et al 1983). Means ± s.e. were calculated and Student's t test was used to determine the significance of difference between paired or unpaired sets of observations. A probability (P value), P=0.05 or less was regarded significant.

The mean plasma C_3 and C_4 levels in the control patients, i.e. before administration of the muscle relaxants, were 1.154 ± 0.048 g L^{-1} and 0.326 ± 0.028 g L^{-1}, respectively. The mean C_3 and C_4 levels in patients given vecuronium was 1.07 ± 0.045 g L^{-1} and 0.292 ± 0.013 g L^{-1}, respectively (i.e. a decrease of 7.3 and 10.4%, respectively, P= not significant). The mean C_3 and C_4 levels in pancuronium was 1.24 ± 0.068 g L^{-1} and 0.353 ± 0.038 g L^{-1}, respectively (i.e. an increase of 6.9 and 7.6%, respectively, P= not significant).

The results showed that vecuronium and pancuronium, in clinical doses of 0.1 $mg.kg^{-1}$, produced differential effects on complement components C_3 and C_4, with vecuronium reducing and pancuronium increasing these levels in the patients studied. However, these changes were not found to be statistically significant at these doses. Thus, the two muscle relaxants are unlikely to produce adverse reactions and/ or activate the complement activated histamine release.

Hunter, J.M. (1987) Br.J.Anaesth. 59:46-60
Vergani, D. et al (1983) J.Clin.Pathol. 36:793-797
Watkins, J. (1986) Br.J.Anaesth. 58:19S-22S