Interaction of suxamethonium with intravenous induction agents

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Since the eugenol anaesthetics prolong the action of suxamethonium when the steroid intravenous agent, Althesin (alphaxalone 9 mg/ml, alphadolone acetate 3 mg/ml), was introduced it was necessary to study its interaction with this relaxant. These findings are reported here and compared with previous findings with three other groups of induction agents or with lightly anaesthetized inhalational control series.

All observations were carried out on adult patients premedicated with 0·6 mg atropine. The effects of 25 and 50 mg suxamethonium were studied. Three barbiturates (thiopentone 4 mg/kg, thialbarbitone 8 mg/kg and methohexitone 1·6 mg/kg) were given to equal numbers of patients. Two eugenols (propanidid 4 mg/kg and G 29,505 4 mg/kg) were used, 100 in each series receiving propanidid. The dose of Althesin was 50 μl/kg and that of ketamine was 2 mg/kg. The smaller dose of suxamethonium was studied in fit women while the 50 mg dose was studied in completely unselected patients. The time of the first respiratory effort was noted and also when respiration was judged to be clinically adequate.

The frequency and average duration of apnoea was not significantly different during light inhalation and barbiturate anaesthesia. Although respiratory depression was longer with barbiturates ($t=2·74$; $P<0·01$), this difference is of no clinical significance.

Suxamethonium	Twenty-five (25)				Fifty (50)			
	Inhalational	Barbiturates*	Althesin	Eugenols*	Barbiturates†	Althesin	Eugenols†	Ketamine‡
No. of patients	50	150	50	125	300	100	150	62
Apnoea:								
% frequency	70	67	70	87	100	99	100	100
Av. duration (sec)								
—all cases	61±7·0	69±5	74±8	136±16	196±10	211±9	326±11	328±13
—apnoeic cases only	94±7·1	1,031±5	105±6	155±9				
Respiratory Depression:								
Av. duration (sec)	147±5·7	167±5	169±9	260±9	321±11	311±10	459±31	451±18

Respiratory depressant effects of 25 and 50 mg suxamethonium given immediately after four different groups of induction agents. Data from *Clarke, Dundee & Daw, 1964; †Clarke, Dundee & Hamilton, 1967; ‡Bovill *et al.* 1971.

The findings with the three barbiturates were almost identical as were those with the two eugenols. There was no significant difference between the respiratory effects of suxamethonium after a barbiturate or steroid anaesthetic. Its action was significantly prolonged after the eugenols as compared with those patients given either a barbiturate or steroid ($P<0·01$ in 25 mg suxamethonium study and $P<0·001$ in 50 mg study). Ketamine also prolonged the effect of suxamethonium in a manner quantitatively similar to the eugenols.

The action of the eugenols has been attributed to their effects on plasma pseudocholinesterase but no explanation can be offered for that of ketamine.

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