Title : RESPIRATORY EFFECTS OF DROPERIDOL

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Introduction. Droperidol, a butyrophenone derivative, is widely used in anesthesia. Some reports have been published about its respiratory effects;[1,2] but the ventilatory response to CO_2 rebreathing or mouth occlusion pressure measurements have not been reported. These were made in this study.

Materials and methods. To evaluate the respiratory effects of droperidol, the ventilatory response to CO_2 was determined by a modified Read[3] rebreathing method, while mouth occlusion pressure ($P_{0.1}$) was measured according to the procedure described by Whitelaw et al.[4] Eight ASA class I volunteers (4 women-4 men; age: 23-38 years) gave written informed consent for the study; institutional approval was obtained. None was taking medication and all had fasted overnight. Subjects were studied in the reclining position with the head up 30° and were connected to an 8 liter closed circuit system initially filled with a 3% CO_2-50%O_2 47%N^2 gas mixture. During each rebreathing test (5 to 7 min long), $P_{0.1}$, fraction of CO_2 in the bag and electronically integrated mouth flow were simultaneously recorded. Two CO_2 rebreathing control runs were made before droperidol administration; additional breathing tests were performed 30, 60, 90, 150 and 240 min after the intravenous injection of droperidol, 0.3 $mg.kg^{-1}$. Functional residual capacity (FRC) was measured by a helium dilution technique before and 15 min after droperidol administration. The slopes of the ventilatory response to CO_2 ($\dot{V}E$) vs the partial pressure of CO_2 (PCO_2) and of the Log $P_{0.1}$ vs PCO_2 were determined by the least squares linear regression method in the 48-70 torr PCO_2 range. In this range, PCO_2 in the bag can be assimilated to end tidal PCO_2.[3] Intercepts were calculated at a PCO_2 of 60 mmHg. The slopes and intercepts of the lines were compared using F tests. Mean values (±SD) at various time intervals following droperidol injection were compared with control values using analysis of variance.

Results. There was no significant difference in the mean slopes and intercepts of the $\dot{V}E/PCO_2$ and Log $P_{0.1}/PCO_2$ relationships before and after droperidol injection at all time intervals (table). In the first runs following injection two subjects had increased slopes and intercepts of both variables, two had slightly decreased slopes and intercepts. In four, there were no changes.
No significant change in FRC was observed after drug administration (97.5±6% of control value) indicating experimental conditions were the same before and after droperidol injection.

Discussion. In this study, we administered a relatively large IV dose of droperidol in order to emphasize any physiological effects that might occur. The absence of significant changes suggests that droperidol is free of consistent effects on respiratory function. However, it is of interest that two subjects showed some evidence of respiratory depression and two others were stimulated. This seeming discrepancy in results may be due in part to the variable incidence and nature of the side effects of droperidol such as dyskinesia and anxiety, which were observed during the experiment. It is possible that dyskinesia may have interfered with respiratory mechanics. Overall, however, it can be concluded that a single, large IV dose of droperidol is devoid of serious respiratory depressant effects.

Table. Mean (±SD) slopes and intercepts of Log $P_{0.1}/PCO_2$ relationships calculated on eight subjects, before and after drug injection

	$P_{0.1}$ cmH_2O		$\dot{V}E$ $l.min^{-1}$	
	Slope Log $P_{0.1}$ / PCO_2	$P_{0.1}$ at PCO_2 60 mmHg	Slope $\dot{V}E$ / PCO_2	$\dot{V}E$ at PCO_2 60 mmHg
Control	0.072	5.8	1.02	29
	±0.027	±2.5	±0.60	±12
30 min	0.056	6.1	0.87	27
	±0.025	±3.1	±0.57	±11
60 min	0.068	6.6	0.94	28
	±0.032	±3.4	±0.56	±11
90 min	0.062	6.3	0.90	30
	±0.025	±2.5	±0.46	± 9
150 min	0.063	6.3	0.98	30
	±0.022	±2.8	±0.54	± 9
240 min	0.058	5.4	0.82	27
	±0.020	±1.8	±0.52	±10

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