

Date :
 Title : EFFECT OF DROPERIDOL ON THE DURATION OF ANALGESIA AND DEVELOPMENT OF TOLERANCE TO INTRATHECAL MORPHINE
 Authors : K. C. Kim, M.D., R. K. Stoelting, M.D.
 Affiliation : Department of Anesthesia, Indiana University School of Medicine, Indianapolis

Introduction. Tolerance to the analgesic effects of intrathecal administration of narcotics has been demonstrated. Reduction of the narcotic dose might decrease the likelihood of tolerance. The systemic administration of droperidol is known to enhance the analgesic effects of narcotics. Therefore, we speculated droperidol might reduce narcotic requirements for intrathecal administration. This study reports the effect of droperidol on the duration of analgesia and the development of tolerance when both drugs were injected into the lumbar subarachnoid space of rats.

Methods. A lumbar laminectomy was performed in eighteen anesthetized rats (wt ± gm). A polyethylene tube was inserted between the L4-5 interspace and threaded approximately 1 cm cephalad. Animals were divided as follows:

1. Group A (n-6) - intrathecal morphine 25 ug in 10 ul once a day for 10 days.
2. Group B (n-6) - intrathecal morphine 25 ug and droperidol 25 ug in 10 ul once a day for 10 days.
3. Group C (n-6) - saline 10 ul once a day for 10 days.

The onset of drug effect, duration of analgesia and evidence of tolerance were determined daily using the response to a hotplate and forceps pinch applied to the hindpaw.

Results. As Table I indicates, the mean duration of analgesia of Group B was 210 minutes which was 40% longer than that of Group A.

Acute tolerance was developed rapidly from the third day in both groups. On the fifth day the duration of analgesia in Group A was 60 minutes and that of Group B was 120 minutes. The mean duration of analgesia was reduced by 60% and 43% on the fifth day in Group A and Group B respectively.

The result of the pinch test was similar to the hotplate test; the details of the pinch test was not included in this summary.

Discussion. Potentiation and prolongation of narcotic analgesia by systemic neuroleptic drugs is well known. These data demonstrate that intrathecal administration of droperidol prolongs the duration of analgesia produced by subarachnoid morphine. In addition, tolerance to morphine was reduced when both drugs were given intrathecally.

These data suggest that a system in the brain that responds to droperidol so as to enhance morphine analgesia may also exist in the spinal cord. Simultaneous administration of droperidol and morphine intrathecally may prove beneficial in treating chronic pain.

TABLE I

DURATION OF THE ANALGESIA OF THE HOTPLATE TEST IN INDIVIDUAL GROUP OF ANIMALS ON THE FIRST DAY

MIN.		CONT	30	60	90	120	150	180	210	240
Grp A	M	2.6	7.2	9.1	9.0	7.2	6.0	3.2	2.4	
Morp.	S	0.7	2.0	3.1	2.8	1.4	2.1	0.9	0.7	
						*	**	**	**	
Grp B	M	2.2	7.8	10.1	11.4	11.7	10.4	7.4	6.7	3.7
M.D.	S	0.4	1.7	3.0	2.0	2.6	3.0	2.2	2.0	1.1
Grp C	M	3.0	2.8	2.2	2.1	2.1	2.6	2.8	1.7	
Saline	S	0.8	1.0	0.4	0.7	0.8	0.4	0.6	0.7	

M.D. - morphine droperidol

TABLE II

DURATION OF THE ANALGESIA OF THE HOTPLATE TEST IN INDIVIDUAL GROUP OF ANIMALS ON THE FIFTH DAY

MIN.		CONT	30	60	90	120	150
Group A	M	2.7	6.2	4.1	2.1	2.8	
Morphine	S	0.8	1.7	1.8	1.1	1.7	
Group B	M	2.2	8.1	7.0**	6.4**	5.4*	2.4
Morphine Droperidol	S	0.7	2.7	1.6	2.0	1.8	0.9
Group C	M	2.6	2.0	2.6	2.4	2.2	
Saline	S	1.1	0.7	0.8	1.0		

* - significant m - mean value
 ** - highly significant s - standard deviation

Number indicates the latency time. Latency time is the duration of tolerance to hotplate in seconds.