Title : IS HALOTHANE REALLY SAFE IN INFANCY?

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Introduction. Halothane inhalation has become the most frequently utilized technique for anesthetizing infants and children in most pediatric centers. Recently, the safety of halothane administration in infants under 6 months of age has been questioned and debated. This study addresses that subject through analysis of preoperative factors, intraoperative morbidity, and postoperative recovery in a group of infants under 24 weeks of age undergoing the most frequent elective surgical procedure of infancy, inguinal herniorrhaphy.

Methods. 313 unpremedicated patients undergoing inguinal herniorrhaphy during halothane, nitrous oxide (60%), and oxygen inhalation anesthetic are divided into 6 groups according to 4-week age intervals from 0 to 24 weeks. Preoperative factors including hemoglobin, hematocrit, fasting time, and history of respiratory distress syndrome requiring ventilatory support are related to intraoperative parameters including; 1) the incidence of significant intraoperative hypotension, ($\geq$ 30% decrease in systolic arterial pressure from control), 2) the incidence of slow heart rates ($\geq$ 20% decrease in rate from control), 3) the incidence of significant bradycardia ($\leq$ 80 bpm) requiring atropine therapy, 4) the relationship of age to maintenance inspired halothane concentration. Criteria for recovery room dismissal, duration of RR stay, and evidence of postoperative morbidity are noted.

Results. Table I. summarizes the preoperative variables and relationships to intraoperative parameters measured.

The overall incidence of significant intraoperative hypotension was 49.2% with greatest frequencies noted in infants less than 16 weeks of age who fasted 8 or more hours, and in RDS survivors between 9 and 16 weeks, whose red cell volumes were the lowest. Transient, slow heart rates not requiring treatment were common, especially in older infants. Significant bradycardia requiring treatment was unusual. There were no deaths, cardiac arrests, or serious cardiac arrhythmias. Postoperative nausea and vomiting occurred infrequently and did not require pharmacologic treatment or prolonged hospitalization.

Mean recovery room time was 32 minutes with a range from 20 to 75 minutes. Duration of RR stay varied directly with duration of surgery, but was not related to patient age, anesthetic dose, or intraoperative morbidity as reflected by slow heart rate or hypotension.

Conclusion. Properly monitored and managed infants under 24 weeks of age can be safely anesthetized by halothane inhalation. Intraoperative circulatory depression is common, especially in RDS survivors and infants less than 16 weeks of age and NPO for 8 hours. No evidence of postoperative morbidity associated with intraoperative hypotension was seen in this study.

SUMMARY OF PERIOPERATIVE DATA

Table I.

Age (weeks).	0-4	5-8	9-12	13-16	17-20	21-24
Number of patients.	38	109	73	61	14	18
Incidence of hypotension ($\geq$30% below control).	71.1% n=27	57.8% n=63	34.8% n=28	49.2% n=30	14.3% n=2	22.2% n=4
Duration of hypotension (min).	26.3 ±19.9	27.0 ±18.3	19.0 ±14.9	29.0 ±23.8	22.5 ±12.5	19.0 ±10.8
Incidence of hypotension in those NPO $\geq$8hrs.	50.0% n=6	42.9% n=14	61.5% n=13	56.3% n=16	20.0% n=5	25.0% n=4
Incidence of hypotension in RDS survivors.	33.3% n=3	30.8% n=13	54.5% n=11	66.7% n=12	33.3% n=3	33.3% n=3
Incidence of slow heart rates($\geq$20% below control).	42.1% n=16	43.1% n=47	37.0% n=27	34.4% n=21	50.0% n=7	83.3% n=15
Duration of slow heart rates (min).	18.1 ±13.5	25.0 ±20.2	21.0 ±17.9	22.0 ±24.7	37.1 ±33.7	18.0 ±21.4
Atropine (0.01 mg/kg I.V.) required for significant bradycardia ($<$80bpm).	7.9% n=3	8.2% n=9	9.5% n=7	13.1% n=8	5.9% n=1	-0-
Duration of anesthesia (min).	76.3 ±16.9	70.0 ±13.9	69.0 ±20.3	72.0 ±18.7	70.0 ±15.6	64.0 ±18.7
Duration in PAR (min).	38.1 ±19.8	34.0 ±11.6	31.0 ±8.1	32.0 ±8.6	30.4 ±7.5	29.0 ±7.1
Inspired holothane (%) (30 min pinduction).	1.4 ±0.5	1.5 ±0.4	1.5 ±0.5	1.6 ±0.4	1.5 ±0.6	1.6 ±0.6

Values are mean ± S.D. unless specified otherwise.