TITLE: CARDIOVASCULAR RESPONSES DURING DESFLURANE ANESTHESIA IN INFANTS AND CHILDREN

AUTHORS: RH Taylor MB, FFARCS, J Lerman MD, N Sikich RN, B Shandling MB, FRCSC.
AFFILIATION: Anes Dept and the Research Inst, The Hospital for Sick Children, University of Toronto, Ont

Recent reports suggest that desflurane (DF) a new inhalation anesthetic produces a fall in systemic vascular resistance and blood pressure and an increase in heart rate (HR) anesthesia[1,2]. To determine the effect in cardiovascular hemodynamics in infants and children we undertook the following study.

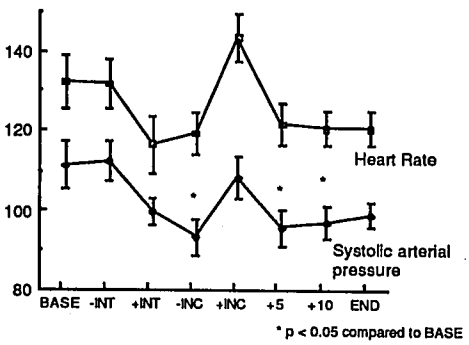
With Institutional Ethical approval and parental consent we investigated the HR, systolic blood pressure (SAP), and oxygen saturation (SpO2) prior to and during DF anesthesia in 24 unpremedicated, ASA physical status 1 or 2, infants and children. Anesthesia was induced with DF in O_2. The trachea was intubated under deep DF anesthesia in O_2. Anesthesia was maintained after skin incision with 7-12% DF in 60% N_2O in O_2. Ventilation was controlled to maintain normocapnia. Blood loss was less than 5% of blood volume and 5 mls/kg/hr of crystalloid fluid was infused for each patient. HR, SAP and SpO_2 were recorded before the start of anesthesia (BASE), before intubation (-INT), after intubation (+INT), before skin incision (-INC), after skin incision (+INC), after 5 minutes of surgery (+5), 10 minutes of surgery (+10) and at the end of surgery (END). Data was analyzed using repeated ANOVA and the Neuman-Keuls test ($p<0.05$)

The children were aged 2 months-12 yrs (n=24). The duration of DF anesthesia was (mean ± SD) 33 ± 20 minutes. The HR did not change from BASE. The SAP decreased significantly prior to an after skin incision compared to BASE. SAP returned to baseline at +INC but then decreased + 5 and 10 minutes. End-tidal DF concentration was 12.6 ± 2.0% at intubation and 8.5 ± 2.1% at the end of surgery

Although the MAC of desflurane has not been determined in infants and children, we administered age-dependent DF concentrations that were proportional to MAC values determined previously for halothane and isoflurane.[3] We conclude that DF produces stable hemodynamics in infants and children when it is used as an induction agent in O_2 and a maintenence agent with 60% N_2O in O_2.

Supported with a grant from Anaquest Inc.

1. Eger et al. Anesth Analg. 67:1174-6, 1988
2. Weiskopf et al. Anesth Analg. 70:S450, 1990
3. Cameron et al. Anesth Analg. 63:418, 1984



A1105

TITLE: SPONTANEOUS MINUTE VENTILATION DURING HALOTHANE ANAESTHESIA IN INFANTS AND CHILDREN

AUTHORS: KA Brown,MD, B Bissonnette, MD, H Holtby,MB, L Gerus MD, B Macpherson, MD, SH Ein, MD, B Shandling, MB
AFFILIATION: Depts Anaes & Surg, The Hospital for Sick Children & The Research Institute, U of Toronto, Toronto, Canada, M5G 1X8.

The practice of spontaneous ventilation during mask halothane (H) anaesthesia for elective inguinal hernia repair, in our institution offered a unique opportunity to evaluate the infant's minute ventilation and to assess parameters of ventilatory drive (mean inspiratory flow, VT/Ti) and timing (the ratio of inspiration to total respiration, Ti/TTot)[1].

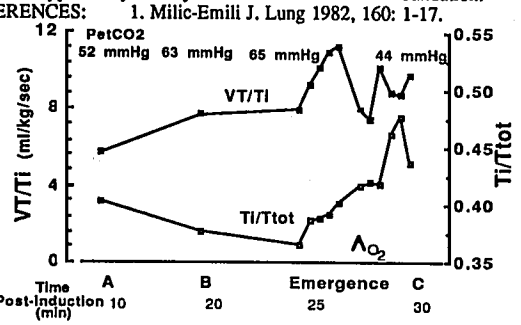
The protocol was approved by the Human Ethics Committee and informed parental consent was obtained. 7 ASA 1 infants (Group 1) and 5 ASA 1 children (Group 2) undergoing elective inguinal hernia repair were studied. Anaesthesia was induced with atropine (0.2 mg/kg) and Thiopentone or H. Anaesthesia was maintained with 70% N_2O in O_2 and 2% H (Group 1) and 2.5% H (Group 2). Unintubated children breathed spontaneously through a modified Jackson-Rees circuit with a fresh gas flow of 12 L/min. Mouth pressure (Microswitch 142PC050) and flow (Fleisch pneumotachograph #0 (Group 1) or #1 (Group 2), Microswitch #163PC1D36) were measured. Signals were recorded on a Hewlett-Packard 4 channel magnetic tape recorder and played back through a 12 bit A to D board (Data Translation), sampled at 50 Hz and recorded on computer for breath -by-breath analysis (Anadat, JHT Bates). The flow signal was zero flow offset, drift corrected and mathematically integrated to volume. Start and End inspiration were defined by the points of zero flow crossing. The ratio Ti/Ttot was determined. Digital readings of end tidal $PETCO_2$ (Datex Capnomac), were recorded. The surgical procedure was divided into 3 stages: A) Pre-incision, B) Division of the Hernia Sac and C) arousal just prior to spontaneous movement. Intra- and Inter-group differences were assessed with ANOVA and SNK test. A $P<0.05$ was accepted for statistical significance.

In Group 1, the mean (± SD) age and weight of the infants was 2.7±0.49 months and 5.8±0.5 Kg. In Group 2, they were 2.9±1.1 years and 15.5±1.5 Kg. A typical surgical course is shown below. Results are tabled below. There was no statistically significant response to surgical stimulation.The maximum $PETCO_2$ was 60.9±5.7 mmHg in Group 1 and 62.0±6.0 mmHg in Group 2.

In Group 1, minute ventilation decreased during Stage A, and was statistically different from Stage C. There were no significant inter-group differences. We were unable to support the notion that the infant displays a greater degree of respiratory depression than the older child.

Supported by the Physicians' Services Institute Foundation.

REFERENCES: 1. Milic-Emili J. Lung 1982, 160: 1-17.



Group	Stage	Minute Ventilation (ml/kg/min)	VT (ml/kg)	RR (bpm)	V_T/T_i (ml/kg/s)	T_i/T_{Tot}
1	A	175.08	2.1	60.1	7.99	0.36
		±55.47	±1.46	±11.0	±1.98	±0.05
	C	380.40	6.56	59.4	16.73	0.38
		±97.75	±1.51	±14.4	±4.69	±0.05
2	A	173.65	3.73	46.8	8.45	0.34
		±22.02	±0.42	±6.8	±1.3	±0.02
	C	248.92	7.09	35.5	11.20	0.37
		±41.56	±1.46	±5.4	±2.25	±0.04