

Intubating conditions following four different doses of propofol

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Introduction:

- Day case surgery offers advantages to the patient, their family and institution.
- Children are excellent candidates for day case surgery since they are generally healthy, mostly requiring surgical intervention of short duration.
- Day case surgery requires rapid emergence from anaesthesia, minimal delay in recovery and rapid readiness for discharge from the ward.
- The ideal anaesthetic agents must have rapid onset, short duration, minimal side effects and minimal residual effects.
- Muscle relaxants provide excellent intubation conditions, but their duration of action often exceed that of the procedure, risking residual paralysis during recovery and delaying discharge from the day unit – thereby nullifying most of the advantages of day case surgery.
- The pharmacodynamics and -kinetics of propofol and alfentanil are well suited for day case surgery.
- Propofol is known to cause dose dependant hypotension on induction.
- Optimal dosing schedules for intubation during day surgery, while maintaining haemodynamic stability, warranted further refinement.

Methods and materials:

- Ethics committee approved / patient consent obtained.
- Double-blind, randomised controlled trial.
- Calculated sample size 44 patients to detect clinically significant (>20%) decrease in blood pressure.
- Randomised into 4 groups according to propofol dose: 0.5, 1, 1.5 or 2mg/kg.
- Standardised induction with sevoflurane (in 50% oxygen/nitrous oxide), placement of IV access followed by alfentanil 10µg/kg, then received propofol according to randomisation group.
- Adequate intubation conditions with least haemodynamic variation assessed by: i) ease of intubation (using Helbo-Hansen Intubation Score), and ii) blood pressure prior to induction, after propofol administration and after intubation.
- Factors scoring 1 or 2 were considered adequate intubation conditions.
- Factors scoring 3 or 4 were considered inadequate intubation conditions.

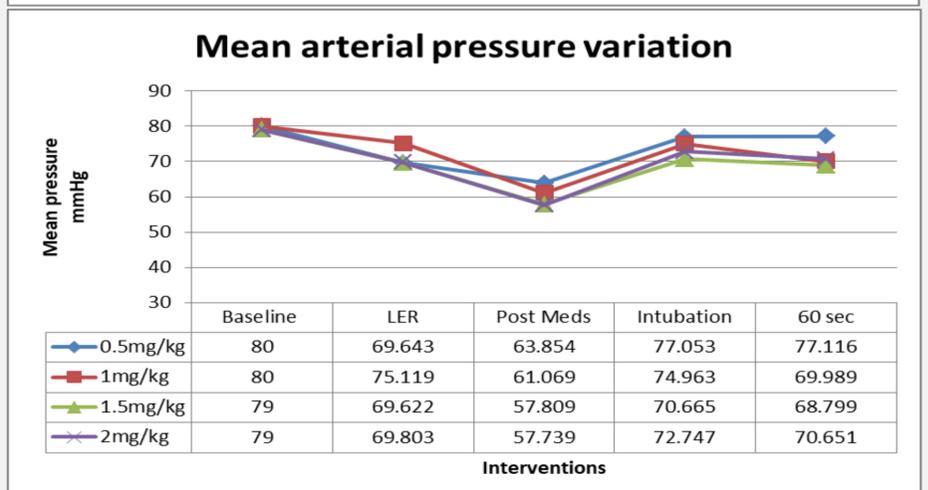
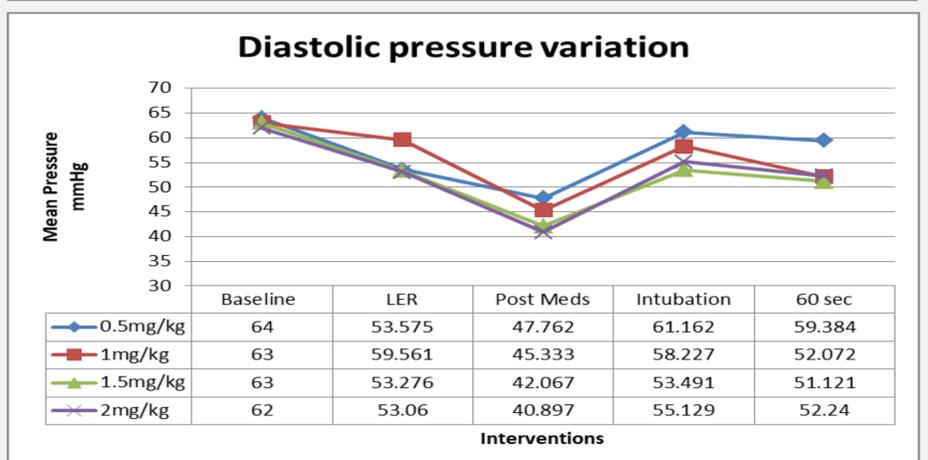
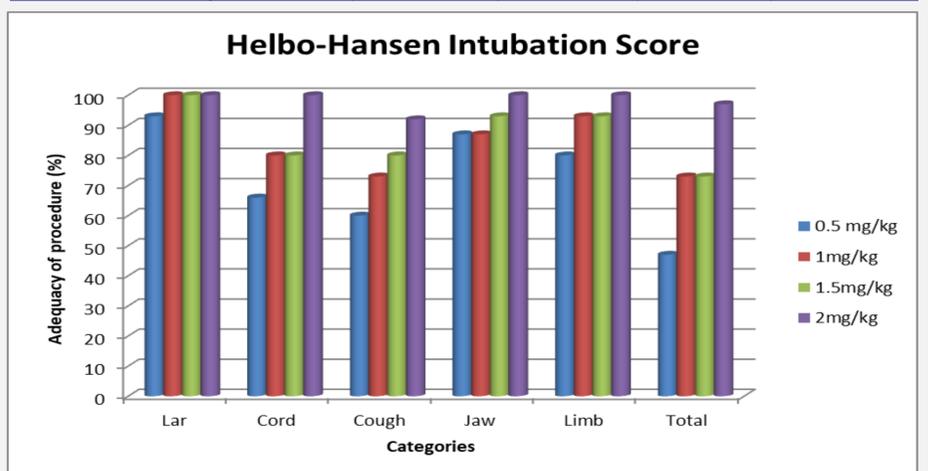
Helbo-Hansen Intubating Score ¹				
Factors assessed	1	2	3	4
Laryngoscopy	Easy	Fair	Difficult	Impossible
Vocal Cords	Open	Moving	Closing	Closed
Coughing	None	Slight	Moderate	Severe
Jaw relaxation	Complete	Slight	Stiff	Rigid
Limb Movements	None	Slight	Moderate	Severe (jerky)

Results:

- Fifty nine children (aged 3-10 years) for dental extractions recruited.
- Groups were comparable for age, sex, weight and duration of surgery.
- Significant decreases in vocal cord movement (p = 0.0341), incidence of coughing (p = 0.0379) and limb movement (p = 0.0165) was observed as propofol dose increased.
- Ease of laryngoscopy (p = 0.1319) and jaw relaxation (p = 0.1971) did not improve significantly as propofol dose increased.
- Overall adequacy of intubating conditions (total score) improved as propofol dose increased (p = 0.0079).
- Blood pressure decrease as propofol dose increased was almost statistically significant for diastolic (p = 0.0514) and mean arterial pressure (p = 0.0616).
- Blood pressure decreases were clinically significant (>20%) with all doses;
 - Diastolic pressure by 25.3 to 34% from base line
 - Mean blood pressure by 20.1 to 26.9% from base line
- Blood pressure returned to within 10% of baseline once intubation was achieved.

Adequacy of intubation scores related to dosage of propofol

Propofol dose	0.5mg/kg	1mg/kg	1.5mg/kg	2mg/kg	Trends of Odds
Parameter	(n = 15)	(n = 15)	(n = 15)	(n = 14)	
Laryngoscopy	14 (93%)	15 (100%)	15 (100%)	14 (100%)	p = 0.1319
Vocal cord	10 (66%)	12 (80%)	12 (80%)	14 (100%)	p = 0.0341
Coughing	9 (60%)	11 (73%)	12 (80%)	13 (92%)	p = 0.0379
Jaw relaxation	13 (87%)	13 (87%)	14 (93%)	14 (100%)	p = 0.1971
Limb movement	12 (80%)	14 (93%)	15 (100%)	14 (100%)	p = 0.0165
Total score	7 (47%)	11 (73%)	11 (73%)	13 (93%)	p = 0.0079



Legend: Baseline = before induction, LER = loss of eyelid reflex, Post Med = after propofol, Intubation = after intubation, 60 sec = 1 minute after intubation.

Conclusion:

- For day case procedures where intubation is necessary, but muscle relaxant duration of action exceed the duration of surgery, the use of propofol in a dose of 1 to 1.5mg/kg and alfentanil 10µg/kg is recommended to aid intubation.
- This dosing schedule allows intubating conditions comparable to those achieved by means of muscle relaxants whilst maintaining adequate cardiovascular stability.