

Title: PREMEDIATION PROFOUNDLY INFLUENCES HEMODYNAMICS DURING RAPID SEQUENCE INDUCTION WITH SUFENTANIL-SUCCINYLSCHOLINE FOR AORTOCORONARY BYPASS GRAFTING

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Introduction. Premedication drugs, rarely selected for their hemodynamic effects, do influence hemodynamic variables. For example, lorazepam premedication yields lower cardiac indices and heart rates during high-dose fentanyl-atracurium anesthesia than morphine-scopolamine.¹ We have previously identified sufentanil-succinylcholine as preferable to etomidate-succinylcholine² in patients who require rapid-sequence induction. The following study tests whether premedication influences hemodynamics² during sufentanil-succinylcholine anesthesia.

Methods. After obtaining institutional review board approval and informed consent, thirty-three patients scheduled for elective aortocoronary bypass, all with ejection fractions > 0.5, were randomly assigned to receive morphine 0.1 mg/kg im and either scopolamine (sco) 6 µg/kg im (n=16) or lorazepam (lor) 60 µg/kg po (n=17) 90 minutes prior to their arrival in the surgical suite. Patients were excluded for: recent myocardial infarctions, pacemakers, drug abuse, vasoactive drug infusions, or medical conditions contraindicating a study drug. ECG leads II and V5, central venous, systemic, and pulmonary arterial pressures, and finger pulse oxygen saturation were continuously recorded throughout the study. Patients inhaled oxygen during baseline measurements. Anesthesia was induced with i.v. bolus sufentanil 5 µg/kg and succinylcholine 1 mg/kg. Measurements were repeated 1 min later (tracheal intubation immediately followed), then again 3 and 6 min following induction. Blood pressure and heart rate were controlled using a standardized management protocol. After the study, anesthesia was maintained with sufentanil (an additional 5 µg/kg), metocurine or pancuronium, lorazepam (2 mg), and enflurane. All ECG data were reviewed by a cardiologist who was unaware of the patient's treatment group or hemodynamic status. Significance of results was assessed using t-test, analysis of variance (ANOVA) or covariance (ANOCOVA), Fisher's exact test, or Chi-square. P < 0.05 was assumed significant.

Results. Baseline (pre-induction) demographic and hemodynamic data were similar. Pooled data from both groups demonstrated a consistent, overall effect of time (by ANOVA) on heart rate, mean arterial pressure, cardiac index, and left ventricular stroke-work index, permitting our use of ANOCOVA to define differences between the groups at the 3 and 6 min measurements (table). Five patients (3 sco, 2 lor) required drug intervention to restore arterial pressure to an acceptable level. No patient required treatment for bradycardia. No patient developed new ischemia during the study.

None of the patients reported intraoperative awareness.

Discussion. Despite nearly identical demographic characteristics and preinduction hemodynamic values, patients premedicated with morphine-scopolamine had markedly greater heart rates and cardiac and left ventricular stroke-work indices following induction than patients premedicated with morphine-lorazepam.

Surprisingly, despite the well-known tendencies of both sufentanil and succinylcholine to produce bradycardia, no patient required atropine. Succinylcholine seemed to protect patients from the precipitous bradycardias which we sometimes briefly observed during induction, before the onset of fasciculations.

We believe that most patients with good ventricular function could safely undergo rapid sequence sufentanil induction following either premedication. However, for patients at risk for hypotension, and especially for those with reduced left ventricular function, morphine-scopolamine may be preferable and may help prevent hemodynamic depression.

References.

1. Thomson IR, Bergstrom RG, Rosenbloom M, et al. Anesthesiology 68:194-200, 1988
2. Butterworth JF IV, Bean VE, Royster RL. Anesth Analg 67:S25, 1988
3. Sherman EP, Lebowitz PW, Street WC. Anesthesiology 66:106, 1987

HEMODYNAMICS DURING RAPID SEQUENCE SUFENTANIL-SUCCINYLSCHOLINE INDUCTION

	Base	1 min	3 min	6 min
Heart Rate (beats/min)				
Sco	62(8)	66(11)*	73(10)*,+	71(12)*,+
Lor	63(12)	63(14)	62(14) ⁺	60(14) ⁺
Mean Arterial Pressure (mmHg)				
Sco	94(13)	83(14)*	92(19)*	92(16)*
Lor	97(14)	81(15)*	82(15)*	86(13)*
Cardiac Index (L/min/m²)				
Sco	2.8(.6)	2.9(.6)	3.3(1.0)*,+	3.3(1.0)*,+
Lor	2.7(.6)	2.8(.7)	2.7(.8) ⁺	2.5(.8) ⁺
Left Ventricular Stroke-Work Index (g-m/m²)				
Sco	48(12)	41(13)*	47(15)*,+	50(15)*,+
Lor	49(8)	39(10)*	40(12)*,+	39(10)*,+

* P < .05 compared to baseline by t-test.

+ P < .05 compared to corresponding value of the other group by analysis of covariance. Data expressed as means (standard deviations).