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TITLE: QT INTERVAL DURING INTUBATION WITH PROPOFOL OR THIOPENTAL

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The prolongation of QT interval by several narcotics has been well documented during anesthesia induction (1) and may be responsible for induction arrhythmias. However, most of the anesthetic incidents have been described after intubation or during the surgical procedure (2). The aim of this study was to investigate the electrocardiographic (ECG) modifications during induction and after tracheal intubation using propofol or thiopental as anesthetic agents.

The study was carried out in 20 adults with informed consent, undergoing abdominal surgery, after local Ethic board acceptation. All patients were 18-40 years old, and ASA 1. They were randomly allocated to receive either propofol (2.5 mg/kg) or thiopental (7 mg/kg). Vecuronium (0.1 mg/kg) and phenoperidine (1 mg) were then injected. Oral intubation and mechanical ventilation (tidal volume 10 ml/kg, F. 10/min) were institued. The ECG lead AVR was continously recorded at a paper speed of 25 mm/s. PR, QRS, QT interval were measured by a physician unawared of the groups. Heart rate correction was made according to Bazett's formula : QTc (msec) = $QT/\sqrt{RR}$.QTc interval was measured before induction (T0), before the injection of vecuronium (T1); i.e. three minutes later, and finally three minutes after tracheal intubation (T2). Blood venous samples, allowed the dosage of calcemia, kaliemia, phosphoremia, magnesemia and gazometry.

Results: There were no significant differences in the mean ages, weights and sex ratio. Biological values and ECG data of all subjects were in the normal range at T0, T1, T2. Calcemia, phosphoremia, magnesemia and the acid-base equilibrium remained stable in both groups, at all times. A marked and comparable increase of PO2 and SaO2 was noted in group 1 and 2, from T0 to T2, while pH remained stable. The evolution of QTc is summarized in table 1 : only in the second group which received thiopental, QTc increased significantly from T0 to T2 ($p < 0.05$: Wilkoxon test). None of the other ECG parameters were modified.

Conclusion : Increase serum concentration of catecholamines, hypokaliemia, hypercalcemia, and an imbalance between sympathetic and parasympathetic tones are able to prolong QT interval. Such situations are usual during anesthesia, and drugs that lengthen the QT interval and decrease the fibrillation threshold have to be avoided. In our study, after intubation, a significant prolongation of QT interval was noted only in the thiopental group, suggesting that the specific effect of catecholamines release may be enhanced by thiopental and not by propofol.

Table 1.

QTc (msec)	Group 1 (propofol)	Group 2 (thiopental)
T0	401 ± 5	398 ± 8
T1	389 ± 5	416 ± 5
T2	417 ± 7 (NS)	425 ± 7 *

Means ± SEM * $p < 0.05$

1. Acta anaesthesiol. Scand., 1983 : 27 : 126-130
2. Anesthesiology., 1977 : 47 : 67-69

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TITLE: PROGNOSTIC SIGNIFICANCE OF ST-SEGMENT ELEVATION IN CABG SURGERY

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Introduction. Electrocardiographic ST-segment elevations after myocardial revascularization may have important clinical implications because they may be indicators of coronary artery spasm or markers of early myocardial infarction. However, the true incidence and more importantly, the prognostic significance of ST-segment elevation are not known. Therefore, we determined the incidence and characteristics of ST-segment elevation and its relationship to postoperative myocardial infarction using continuous electrocardiography in patients undergoing coronary artery bypass graft (CABG) surgery.

Methods. After institutional approval and informed consent was obtained, 200 patients scheduled for elective CABG surgery were studied. Anesthesia consisted of either high–dose sufentanil, fentanyl, isoflurane or halothane. All patients were monitored with continuous ECG (Holter) using leads CC5 and CM5 for 48 hrs preoperatively, intraoperatively and 48 hrs postoperatively. Holter tapes were read by two independent blinded investigators. A significant episode was defined as ≥ 0.2 mV reversible ST-segment elevation at the J-point, lasting for at least one minute. Cardiopulmonary bypass was performed using a bubble oxygenator utilizing hemodilution and moderate systemic hypothermia. Multi-dose cold blood with potassium cardioplegia and topical saline/ice slush were used for myocardial protection during cardiopulmonary bypass. Both 12–lead ECG and CPK-MB isoenzyme levels were obtained preoperatively (control) and daily for the first three postoperative days. Myocardial infarction (MI) was identified by new Q waves on 12–lead ECG and CPK-MB isoenzyme level ≥ 50 U/l.

Results. The highest incidence of ST-segment elevation occurred in the post-revascularization period (intraoperative postbypass or ICU): 32/200 patients (16%), vs. 3 patients (2%) preoperatively, and 2 patients (1%) in prebypass period. Perioperative ST-segment elevations were generally severe, lasting 2 hrs or longer (table 1). Comparison of patients with or without ST-segment elevations revealed no difference in the mean aortic cross-clamp time (56 ± 21 vs. 60 ± 16 min, P = NS), CPK-MB > 50 U/l (8/29=28% vs. 28/135=21%, P = NS), or incidence of MI (3/37=8% vs. 13/163=8% P = NS). Of the three patients with ST-segment elevations and MI, 1 had ST-elevation in the prebypass period and the remaining 2 had ST-elevation after revascularization.

Table 1	Mean ± SD
Mean ST-segment elevation (mm)	3 ± 1
Mean duration (min)	128 ± 227
Mean AUC (mm X min)	293 ± 525

Discussion. Our study demonstrated that:

1. The incidence of severe, reversible ST-segment elevation was not infrequent (16%) despite apparent successful myocardial revascularization.
2. The occurrence of reversible ST-segment elevations after myocardial revascularization did not appear to be related to an increased incidence of postoperative myocardial injury (CPK-MB elevations) or myocardial infarction.