

A1079

Title: ST-SEGMENT CHANGES DURING CESAREAN SECTION

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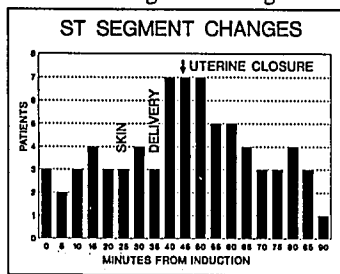
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Introduction: Up to 47% of patients (pts) undergoing cesarean section (CS) may have ECG changes suggestive of myocardial ischemia.¹ These changes are reportedly associated with chest pain, shortness of breath and nausea. We studied ST-segment changes (continuous Holter monitor) during CS with special reference to these symptoms, hemodynamic changes and any possible venous air emboli.

Methods: With institutional review board approval, 57 ASA I(E) and II(E) pts for CS gave consent. Patients had pre- and post-op 12 lead ECG. A Holter cardiac monitor (QMED) was used to monitor leads II and V5 continuously starting 2 hrs before and ending at 4 hrs after surgery. Patients received spinal (n=13) or epidural anesthesia (n=43) to a T4 level. Blood pressure was monitored every 5 mins. A precordial Doppler sensor was used to detect atrial air bubbles. In addition, creatine phosphokinase myocardial fraction (CPK-MB) was measured postoperatively. Statistical analysis was done using t-test and X² analysis.

Results: Twenty nine episodes of ST-segment depression occurred in 14 pts. No episodes of ST-segment elevation occurred. Most ST-changes occurred during uterine closure (Figure). ST-changes occurred in 28% of pts in the epidural group and 15% of pts in the spinal group (p=NS). All CPK-MB fraction results were negative for pts with ST depression and all postop ECG were normal. Nausea, vomiting, chest pain, shortness of breath and air emboli occurred more frequently without than with ST-changes (p=NS, Table). No definite relationship could be demonstrated between BP and ST segment changes. However, 9 episodes of ST-changes were associated with HR increase of 15% or greater.

Discussion: ST depression occurs in 25% of pts undergoing CS. However, they are not associated with any specific symptoms, air emboli, permanent ECG change or evidence of myocardial damage. Further work is needed to determine if tachycardia causes ST-segment changes.



	SYMPTOMS		
	ST dep	normal ST	Total
Nausea	4	21	25
Vomiting	3	11	14
Chest pain	3	18	21
Dyspnea	1	2	3
Air emboli	1	7	8

Reference: 1. Anesth Analg 70:36-43, 1990

A1080

Title: ASSESSMENT OF ELECTROCARDIOGRAPHIC AND ECHOCARDIOGRAPHIC CHANGES DURING CESAREAN DELIVERY UNDER REGIONAL ANESTHESIA

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A recent study (1) found a 47.3% incidence of electrocardiographic (ECG) changes in ASA physical status I and II term parturients during nonemergent cesarean delivery under regional anesthesia. The authors went on to speculate that myocardial ischemia was a likely cause of the ECG changes. The purpose of this study was to evaluate the same patient population by both ECG and transthoracic two-dimensional echocardiography (2DE). 2DE has been found superior to ECG for the intraoperative detection of myocardial ischemia in patients at high risk (2).

Eleven ASA physical status I and II term parturients, 16-41 yr of age (mean 26.7 years), gave informed consent to participate in this institutional review board approved study. 2DE was used to assess myocardial wall motion via parasternal long- and short-axis views and right atrial air via parasternal right ventricular inflow view. 2DE, 7-lead ECG, heart rate, blood pressure, and presence of symptoms were recorded at the following intervals: preinduction, postinduction, skin incision, hysterotomy, delivery, 5 min postdelivery, irrigation, and skin closure. The ECG and 2DE results were later interpreted independently by two cardiologists.

ECG changes, defined as ≥ 1 -mm ST depression or elevation in at least 2 leads, occurred in 5 of 11 patients (45%). In 4 of the 5 patients, the changes occurred at delivery or 5 min postdelivery. No wall motion abnormalities (WMA) were noted at the time of these changes. Three of the 5 patients (60%) complained of symptoms (chest pain, nausea/vomiting) during these episodes. Tachycardia was present in 4 of the 5 patients during ECG changes. Right atrial air was noted in 1 of the 5 patients at the time of ECG changes. WMA were noted in 2 of the 11 patients (18%); one patient experienced 2 episodes. All episodes appeared as mild hypokinesia and resolved spontaneously. Neither patient had ECG changes, right atrial air, or symptoms at the time. None of the episodes of WMA were associated with tachycardia. One of the 3 episodes was associated with hypotension after induction. One patient had both WMA and ECG changes, but not at the same time. Right atrial air was noted on 2DE in 2 of 11 patients (18%). One episode occurred at irrigation and one at delivery. Neither episode was associated with symptoms.

The incidence of ECG changes during cesarean delivery under regional anesthesia has been reported as 47.3% (1), and in a follow-up study (3), 42.8%. Our small group of patients had a similar incidence of 45%. Using WMA, a more sensitive and specific indicator of myocardial ischemia, the present study demonstrated no evidence of WMA during these ECG changes. This conclusion is in agreement with a previous preliminary study (3). Thus, although common, minor ECG changes during cesarean delivery under regional anesthesia do not appear to correlate with either myocardial ischemia or air embolism.

References

1. Anesth Analg 70:36-43, 1990.
2. Circulation 72:1015-1021, 1985.
3. ANESTHESIOLOGY 73:A939, 1990.