



Original Contribution

Association between preoperative maternal anxiety and neonatal outcomes: a prospective observational study^{☆,☆☆}



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Abstract

Study objective: Preoperative anxiety can be associated with poor postoperative clinical outcomes. We aimed to assess whether preoperative maternal anxiety level of obstetric patients scheduled for elective cesarean surgery has an effect on clinical outcome of the newborn.

Design: A prospective observational study.

Setting: Operating room.

Patients: Sixty pregnant women with American Society of Anesthesiologists physical status 1 and 2 scheduled for elective cesarean surgery were enrolled.

Interventions: All patients received spinal anesthesia with hyperbaric bupivacaine 12.5 mg.

Measurements: We performed a State-Trait Anxiety Inventory questionnaire to evaluate preoperative maternal anxiety. We used the Apgar scoring system to assess the physical condition of the newborn. Hemodynamic measurements (heart rate, systolic and diastolic blood pressure) were recorded at baseline, skin incision, childbirth, and 10, 15, and 30 minutes after skin incision. The use of ephedrine, nausea, and vomiting were recorded as well.

Main results: Average preoperative maternal state anxiety score was 41.1 ± 4.6 , and trait anxiety score was 50.9 ± 5.7 . Average Apgar scores of newborns were 7.6 ± 0.8 and 9.2 ± 0.6 , at first minute and fifth minute, respectively. We found no significant relationship between the anxiety scores and Apgar scores at first and fifth minute. Forty-two patients required ephedrine, 5 patients had nausea, and 5 patients had vomiting.

Conclusions: We concluded that there was no relationship between preoperative maternal anxiety scores and Apgar scores at the first and fifth minute.

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1. Introduction

Preoperative anxiety is a common undesirable state associated with adverse physiological response in patients undergoing surgery [1]. Preoperative anxiety activates neuroendocrine systems resulting in an increased heart rate, blood pressure, and cardiac excitation [2]. Preoperative anxiety is associated with elevated plasma catecholamine levels [3], electrolyte imbalance [4], increased postoperative pain, analgesic requirement, and prolonged hospital stay [5]. The experiences of childbirth, cesarean delivery, and anesthesia can produce anxiety in a pregnant woman. Maternal anxiety has a positive relationship with a higher risk of negative outcomes for newborns such as preterm birth and low birth weight [6]. An autonomic stress response triggered by anxiety can cause a fetal distress by vasoconstriction in the uterine arteries [3,6–8].

Recently, midazolam has been shown to reduce preoperative maternal anxiety without adverse outcome in newborns [9]. However, there is a lack of data about the effect of preoperative maternal anxiety on newborn's outcome after cesarean delivery.

We aimed to assess whether there is a relationship between the preoperative maternal anxiety levels and the newborn outcomes after cesarean delivery. If maternal anxiety could lead to negative consequences on neonatal outcomes, anxiety may need to be treated with pharmacologic and/or nonpharmacologic interventions before surgery to improve clinical outcomes.

2. Materials and methods

After obtaining approval of the Ethics Committee of Adana Numune Training and Research Hospital (approval no. 49 on August 14, 2014) and written informed consent from all patients, 60 pregnant women aged 18 to 49 years, with American Society of Anesthesiologists physical status I-II and scheduled for elective cesarean surgery, were included into this prospective observational study. Exclusion criteria were psychiatric or neurologic disorder, nonelective surgery, preterm pregnancies, diabetes mellitus, hypertension, obstetric complications including antepartum hemorrhage and congenital malformations, contraindication for spinal anesthesia or refusal for spinal anesthesia, fetal anomalies, fetal growth retardation, and meconium aspiration.

An anesthesiologist performed a State-Trait Anxiety Inventory (STAI) questionnaire to all patients at 1 hour before entering the operating room. The STAI consists of 2 subscales. The State Anxiety Scale assesses the current state of anxiety at that time. The STAI includes 40 items, with 20 items per subscales. Responses to State Anxiety Scale are as follows: (1) not at all, (2) somewhat, (3) moderately so, and (4) very much so. The Trait Anxiety Scale measures incidence of feelings in general. Responses for Trait Anxiety Scale are as follows: (1) almost never, (2) sometimes, (3) often, and (4) almost always (7).

After intravenous cannulation was established, all patients were monitored using noninvasive blood pressure, electrocardiography, peripheral oxygen saturation monitoring (SpO₂). Thirty minutes before surgery, all patients received at a rate of 10 mL kg⁻¹ h⁻¹ crystalloid fluid infusion. Spinal anesthesia was performed in the sitting position at L3–4 or L4–5 level, and 12.5 mg intrathecal heavy bupivacaine 0.5% was administered via a 25-gauge quincke spinal needle. Supplemental oxygen was administered by a face mask. We used a pinprick test to determine sensory block level, and patients with sensory block level of T4–T6 were included in the study. Systolic blood pressure was maintained over 90 mm Hg after spinal anesthesia. A bolus dose of 10 mg intravenous ephedrine was administered if systolic blood pressure falls below that level. Systolic blood pressure (SBP), diastolic blood pressure (DBP), heart rate (HR), and SpO₂ were recorded at baseline, skin incision, and childbirth and at 10, 15, and 30 minutes after skin incision. Apgar scores were recorded at 1 and 5 minutes after delivery. We evaluated the well-being of neonates using the 10-point Apgar score consisting of 5 assessments (HR, respiratory effort, muscle tone, reflex irritability, and color) with an assigned value of 0 to 2 for each of them. If the total scores are 7 or higher, it denotes that the condition of the newborn is normal. A value between 4 and 6 is considered as a poor condition, and a score of 3 or lower indicates a critical level. The number of patients having hypotension and nausea and vomiting and requiring ephedrine was recorded. After surgery, patients were observed in the postoperative care unit for 30 minutes and then discharged to the ward.

2.1. Statistical analysis

The data were analyzed using SPSS 20.0 software. Categorical variables were summarized as numbers and percentages, and numerical variables were presented as mean and SD (as median and minimum-maximum where necessary). Repeated-measures analysis was used to compare the change in time of continuous variables (hemodynamic measurements) performed on the same individuals at different times. The variables were investigated using visual (histograms, probability plots) and analytical methods (Kolmogorov-Smirnov/Shapiro-Wilk's test) to determine whether they are normally distributed. While investigating the associations between nonnormally distributed variables, the correlation coefficients and their significance were calculated using the Spearman test. A %5 type I error level was used to infer statistical significance.

3. Results

The average age of the patients was 28.9 ± 5.4 years. The number of primiparous and multiparous women were 10 (16.7%) and 50 (83.3%), respectively. We did not find any significant difference for state and trait anxiety scores in terms of

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