

PRE-MEDICATION WITH MIDAZOLAM PRIOR TO CAESAREAN SECTION HELPS TO ALLAY MOTHERS ANXIETY WITHOUT HAVING ANY SIGNIFICANT ADVERSE EFFECTS ON THE APGAR SCORE OF THE BABY

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Abstract

Background: Anxiety is a natural reaction arising in response to entering a different environment such as Operation Theater. Obstetric patients may develop an autonomic stress response which may lead to vasoconstriction in the uterine arteries and cause foetal distress. The aim of this study is to determine the ability of midazolam premedication to reduce stress in obstetric patients and to compare anxiety scores in obstetric patients scheduled for elective caesarean surgery with the regional anaesthesia technique in groups administered sedation using midazolam or without sedation and to compare APGAR scores between new-borns in these groups. **Materials and Methods:** A double blind randomized control trial done on 51 cases aged between 20 years and 40 years indicated for elective Caesarean surgery for their first baby. The subjects were briefed about the study beforehand and provided written consent and consisted of American Society of Anesthesiologists (ASA) groups 1 and 2. We evaluated patient anxiety with the Amsterdam Preoperative Anxiety and Information Scale (APAIS) and measured newborn wellbeing using the Apgar. We analyzed correlation between Apgar and APAIS using the chi square test. $p < 0.05$ after analysis was regarded as significant. **Results:** Our study showed that no significant difference between the patient group A + B was observed in terms of age ($p = 0.93$), weight ($p = 0.54$), ASA ($p = 0.63$). The APAIS results at 5th minute significantly differed between the 2 groups ($p = 0.0001$). **Conclusion:** We concluded that 0.03 mg/kg dose and timing of midazolam we used led to a decrease in the anxiety of mother without having any significant effects on the APGAR score of the baby.

INTRODUCTION

Stress intensity is influenced by numerous factors such as previous pain experiences, education, culture, expectations, environmental factors and support from care givers.^[1] Stress response leads to release of catecholamines and other vasopressors. At full term, uterine vasculature is maximally dilated, but still responds to these vasopressors causing uterine vasoconstriction and decrease the uterine and placental blood flow which adversely affect the neonates.^[2] Therefore, the prevention from maternal stress is potentially important. This can be prevented by giving patients detailed information about their operation and with preoperative pharmacological medications.^[3] Because of the depressive effects of sedatives on newborns, pharmacological medications are omitted, especially in obstetric patients. Many

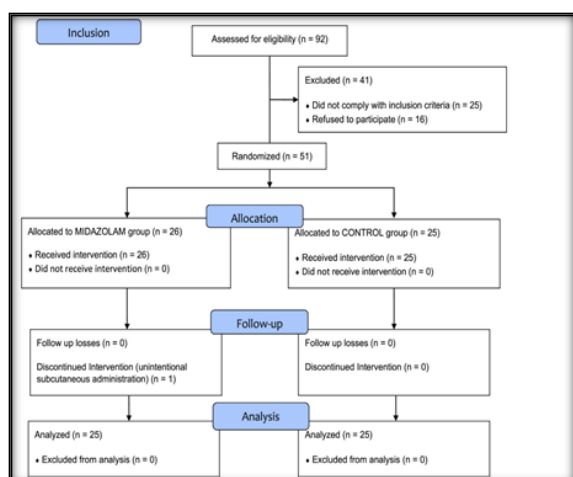
case reports have been published concerning low motor tonus at birth among newborns and pregnant women given diazepam, especially in the 1960s.^[4] these events led to a widespread antipathy to benzodiazepines, and as a result, there are an insufficient number of studies on this subject in the literature. The literature contains a few studies concerning the use of the fast-acting and short-term agent midazolam in Caesarian section (C/S) patients. Midazolam is a highly efficient preoperative sedative and anxiolytic with antegrade amnesia properties.^[5] The aim of this study is to determine the ability of midazolam premedication to reduce stress in obstetric patients and to compare anxiety scores in obstetric patients scheduled for elective caesarean surgery with the regional anaesthesia technique in groups administered sedation using midazolam or

without sedation and to compare APGAR scores between new-borns in these groups.

MATERIALS AND METHODS

A double-blind randomized control trial done on 51 cases aged between 20 years and 40 years indicated for elective Caesarian surgery for their first baby. The subjects were briefed about the study beforehand and provided written consent and consisted of American Society of Anesthesiologists (ASA) groups 1 and 2.

Exclusion criteria: non elective cases, multiple pregnancies, preterm pregnancies, cases with foetal anomalies and retarded foetal development, pathologies that might affect the acid alkaline balance, patients with diabetes mellitus, hypertensive patients, cases with obstetric complications such as ante-partem haemorrhages and congenital malformations, infants with birth weight below 2500 gms or at a risk of meconium/amniotic fluid aspiration. We allocated patients randomly into two groups of 25 members each. The first group was given iv. Premedication with 0.025 mg/kg midazolam (Group I), while the control group was given an equal quantity of SF (Group II) in the waiting room thirty minutes before surgery.



We evaluated patient anxiety with the Amsterdam Preoperative Anxiety and Information Scale (APAIS) and measured newborn wellbeing using the Apgar. We visited patients scheduled for surgery in their rooms for APAIS evaluation. One such scale is the Amsterdam Preoperative Anxiety Information Scale (APAIS)6. Developed by a Dutch group in 1996, APAIS contains six questions enquiring into patients concerns and anxieties. We elected to use APAIS for the objective analysis of anxiety in

patients scheduled for Caesarian surgery since it is short and easy to administer.

On the day of surgery, we administered midazolam 0.025 mg/kg i.v. to Group I patients in the preoperative waiting room when they arrived at the theater for elective surgery. Group II patients were given an equal volume of SF. Thirty minutes before surgery; all patients received crystalloid fluid replacement at a speed of 15 mL/kg per hour via two 20-gauge intravenous cannulae through the back of the hand or the antecubital region. We applied standard monitoring to patients taken for surgery. We performed non-invasive arterial tension, ECG monitorization and pulse oximetry throughout the operation. We enabled all patients to receive 2 L/min oxygen by mask throughout surgery.

For spinal anesthesia, 12.5 mg intrathecal levobupivacaine was given using a 25-G spinal needle with patients in the decubitus position. We determined the level of sensory block with hot-cold and pinprick tests. Surgery commenced when a sufficient level of sensory block was achieved. Following spinal anesthesia, we maintained systolic arterial blood pressure above 90 mmHg. We administered a 10 mg iv. Bolus of ephedrine to cases falling below this level.

Once the baby had been removed, we performed basic neonate examination, and recorded Apgar scores at minutes 1 and 5. Following basic neonate care and the severing of the cord by clamping, we measured and recorded NACS at 15 minutes.

Postoperatively, we evaluated patients in terms of complications: convulsion, nausea, vomiting, vertigo, headache, trembling, ringing in the ears, confusion, a metallic taste in the mouth, itching, hallucination or respiratory depression (respiratory rate less than 10/min and SpO2 below 91%). Patients were kept in the recovery room for 30 min and then sent to the ward.

Statistical Analysis

We analyzed demographic data means and standard deviation using the t test. We analyzed correlation between Apgar and APAIS using the chi square test. $p < 0.05$ after analysis was regarded as significant.

RESULTS

Our study showed that no significant difference between the patient group A + B was observed in terms of age ($p = 0.93$), weight ($p = 0.54$), ASA ($p = 0.63$) (table 1). The APAIS results at 5th minute significantly differed between the 2 groups ($p = 0.0001$) (table 2).

Table 1: Comparison of group age, weight and ASA in between groups

Demographic value	Group A	Group B	P-value
Age (yrs)	28.8±4.40	29.8±4.09	0.93
Weight (kg)	76.4±5.82	75.6±4.36	0.54
ASA	88% ASA I 12% ASA II	92% ASA I 8% ASA II	0.63 0.63

Table 2: Group Amsterdam Preoperative Anxiety and Information Scale (APAIS), APGAR Score analyses

Demographic value	Group A	Group B	P-value
APAIS 1 st min.	18.24±4.23	17.84±3.77	0.725
APAIS 5 th min.	10.84±3.51	15.00±3.29	0.0001**
APGAR 1 st min.	7.28±1.11	7.32±1.51	0.91
APGAR 5 th min.	9.12±0.58	9.16±0.73	0.83

DISCUSSION

Spinal anesthesia used for Caesarean delivery due to its benefits of simplicity, low airway complications, facilitation for postoperative analgesia, decreased blood loss, less neonatal exposure to potentially depressant drugs, and conscious mother at the birth time that creates effective maternal-infant bonding.^[7] Most important objective in anesthesiologist administration of premedication are the suppression of feelings of fear and anxiety and establishment of light state of sleep and amnesia.

Anxieties such as worry over anesthesia, regarding the risk of death, fear the baby may be disabled, fear of pain and worries over loss of bodily control are likely in patients due to undergo surgical procedure. Studies have reported that 60%-80% of patients are anxious in the preoperative period.^[8,9] The patient speaking with relatives before surgery and being prepared psychologically for the operation by being given information about it represent the psychological component of premedication. The pharmacological component in premedication involves overcoming anxiety with pharmacological agents and the establishment of amnesia and analgesia.^[10-12]

Midazolam is a lipophilic drug and can pass through the placenta by passive diffusion. In one experimental animal study on the use of midazolam in pregnancy, midazolam and its metabolite 1-hydroxymethyl midazolam passed through the placenta, and the plasma concentration level was measured. Studies have shown the circulation distribution and half-life of midazolam and its metabolites in both maternal and fetal circulation.^[13] Kanto et al.^[14] administered 0.075 mg/kg iv. midazolam to mothers following baby removal through C/S performed under epidural anesthesia, and patients were exceedingly cooperative when taken into the recovery room. This shows the superiority of midazolam over other benzodiazepines as a fast-acting and short-term agent.

In one study on the subject, Frölich et al. administered a single dose of 0.02 mg/kg midazolam and 1 mcg/kg fentanyl iv. to patients undergoing C/S. It was administered during the skin-cleaning step prior to spinal anesthesia. The newborn Apgar scores were not reported to differ between the groups administered the midazolam and fentanyl combination and the control group.⁸ The dose selected in this study was determined as the dose that would not lead to maternal depression or impair respiration but that would have a clinical effect on anxiety. The dosage and timing of the pharmacological agents used for premedication are

very important. For that reason, we administered 0.025 mg/kg midazolam i.v. while the patients were still in the operating theater waiting room.

We chose this time to suppress increased anxiety in pregnant women a patient group with particular characteristics before entering the theater. We believe that the weak point of Frölich et al.^[8] (2006) study was that they administered fentanyl and midazolam immediately before the spinal anesthesia procedure. We planned this study with the intention of being able to administer routine pre-medication in our clinic to this special patient group in which the pre-caesarean emotion is very intense. In addition, we determined the dose selected in that study (midazolam 0.02 mg/kg and fentanyl 1 mcg/kg) as one that would not lead to maternal depression or impair respiration but would still have a clinical effect. We therefore selected a 0.025 mg/kg dose that was close to theirs and which we considered effective in our own clinical practice. In a study published by Fung et al. in 1992¹⁵, 90% of mothers reportedly fell asleep before surgery with midazolam administered iv. for sedation purposes in C/S performed under spinal anesthesia. They reported no difference in these operations between newborn Apgar scores and umbilical vein pH values compared to those of the control group.^[15] One of the main reasons for sedation being declined prior to Caesarean surgery under regional anesthesia is reported as the mother's desire to see her baby being born and remember that moment.^[16]

The dose used in our study was regarded as meeting our criteria of not causing amnesia in the mother or preventing her from seeing the baby being born and remembering "that moment." Heyman and Salem recommended in 1987 that anxiety in this period could be overcome by talking with the patient or playing music after the extraction of the baby, rather than administering midazolam, and that the amnesic characteristics of midazolam could thus be avoided.^[17] However, this is not intended to reduce the patient's preoperative anxiety. In our opinion, it is more useful for anxiety to be eliminated or at the very least minimized during the period when anxiety is at its peak, when entering the operating theater and before the emergence of the baby, rather than during the period after the emergence of the baby when the mother is emotionally relaxed.

Postoperatively the patients were checked for convulsions, nausea, vomiting, vertigo, headache, trembling, ringing in the ear, confusion, a metallic taste in mouth, hallucinations, respiratory depression (RR<10 or spo2< 91% on room air). None of the patients reported these side effects. This helps us to understand that midazolam in the dosage used does

not have any adverse effects on the mother as well during the perioperative period in our study.

CONCLUSION

We concluded that 0.03 mg/kg dose and timing of midazolam we used led to a decrease in the anxiety of mother without having any significant effects on the APGAR score of the baby.

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