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Effect of Oral Diazepam on Newborn as Premedicant: a Study of 100 Patients Undergone Caesarian Section

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Abstract

Oral diazepam as premedicant is useful to keep the patient haemodynamically stable causing no harm to the baby. In obstetrics, benzodiazepines may be used as sedative, narcotics adjuvant, anticonvulsants and premedicants prior to Caesarian section. One hundred full-term pregnant women of ASA grade I and II were enrolled in this study. The study sample was divided into two groups. No premedication was given in group A. In group B, diazepam premedication, 0.2 mg/kg body weight orally was given 90 minutes before operation with the aim to see the effectiveness of diazepam on APGAR score as oral premedication. In both the group A and B there was no significant difference of APGAR score.

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Introduction

Anaesthesia for Caesarian section need to render the mother unconscious and to avoid injury to the baby with anaesthetic agents, which are readily transmitted through the placenta.[1] There has been much recent interest in the use of low concentration of halothane, enflurane and isoflurane as supplements to nitrous oxide anaesthesia. These agents permit increased inspired oxygen tension in the mother. The main disadvantages of these agents are that uterine muscle tone may decrease and postpartum blood loss may increase.[2] This is a particular problem during Caesarian section, where there is no sedative premedication, low inspired concentration of nitrous oxide and volatile agents, and withholding of opioids until after delivery.[3] Although the neonate is capable of metabolizing small doses of diazepam, when the total maternal dose during labour exceeds 30 mg, the drug and its active metabolite persist in pharmacologically active concentration for at least a week in the neonate.[4] In small doses, investigators have found minimal foetal and neonatal effects. APGAR score is the valuable guideline for the assessment of the neonates. Depending on the heart rate, respiratory effort, muscle tone, reflex irritability and colour of the neonate, APGAR score is calculated. The APGAR score recorded at 1 minute and again at 5 minutes after delivery remains the most valuable assessment of the neonate. The 1 minute score completed with survival while 5 minutes score is related to neurological outcome.[5]

The present study was aimed to see the effectiveness of diazepam on APGAR score as oral premedicant.

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Material and Method

This was a prospective study carried out in the Department of Anaesthesiology and Intensive Care, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka during the period from November 1993 to March 1995. One hundred full-term (more than 37 completed weeks of gestation) pregnant women of ASA (American Society of Anaesthesiogist) grade I and grade II undergoing elective Caesarian section delivery under general anaesthesia (GA) were selected for the study. The patients were randomly allocated to two groups: Group A and Group B. Group A consists of 50 patients who received no premedication (control group). Group B consists of 50 patients who received tab diazepam, 0.2 mg/kg body weight orally 90 minutes before operation in the ward. Preanaesthetic assessment of both the groups was done properly. Induction was done by thiopental sodium 4 mg/kg IV. Anaesthesia was maintained by using 66% N_2O in O_2 except during UD interval (time interval from initial incision into myometrium to completion of delivery) when 50%N_2O in 0_2 was used. Atracurium 0.5 mg/kg i/v was used for muscle relaxation. APGAR score of the baby was measured at 1 minute and 5 minutes after the delivery of the baby.

The data yielded from this study were compiled and analyzed by paired and unpaired student's 't' test and chi-square test.

Results

The mean age of the study sample in group A was 27.20±2.89 years; and in group B was 27.00±4.49 years mean weight in group A was 57.48±6.27 kg and in group B was 59.28±6.20kg. The mean height in group A was 152.10±3.58 cm and in Group B was 151.4±3.19 (Table-I)

Patients in both group A and B showed no difference in APGAR score at 1 minute and 5 minutes after delivery of baby (Table-II)

Table I: Demographic data (Age, weight and height)

Parameters	*Group A (n=50)*	*Group B (n=50)*	*Student's t test*
Age (years)	27.20±2.89	27.00±4.49	NS
Weight (kg)	57.48±6.27	59.28±6.20	NS
Height (cm)	152.10±3.58	151.40±3.19	NS

Table II: APGAR score of two groups of patients

APGAR score	Group A (n=50)	Group B (n=50)	Student's t test
1 minute	7.96±1.24	7.80±1.35	NS
5 minute	9.08±1.00	8.96±1.00	NS

All values are mean ± SD
Group A= Without premedication
Group B= With premedication

Discussion

Diazepam is a benzodiazepine that is widely used by the anaesthesiologist for the induction of anaesthesia, as a premedicant, to provide sedation during regional anaesthetic techniques and as the sole anaesthetic agent during short diagnostic or surgical procedure.[6] Diazepam has been used to provide sedation during labour and delivery, while large doses have been given as sedative and anticonvulsants to eclamptic patients. However, in some cases, there is hypothermia and respiratory depression in the neonate. Diazepam reduces the minimum alveolar concentration (MAC) for halothane and thus anaesthetic requirement is reduced following diazepam premedication. A recent study,[7] suggests that in inspired oxygen concentration of 33% is adequate to ensure adequate foetal oxygenation, at least in the absence of foetal distress. There is no doubt that the adoption of a technique employing 67% nitrous oxide and a volatile anaesthetic supplement would reduce the incidence of recall substantially during the predelivery phase of Caesarian section. Oral diazepam as premedicant is useful to keep the patient haemodynamically stable causing no harm to the baby. In obstetrics, benzodiazepine may be used as sedative, narcotics adjuvant, anticonvulsants and premedicants prior to Caesarian section. These drugs possess anxiolytic,

hypnotic, and anticonvulsant, muscle relaxant and anterograde amnesic effects. The drug rapidly crosses the placenta, and maternal and foetal blood levels are approximately equal within minutes of an intravenous dose.[8] Although the neonate is capable of metabolizing small doses of diazepam, when the total maternal doses during labour exceeds 30 mg, the drug and its active metabolite persist in pharmacologically active concentration for at least a week in the neonate.[4] When diazepam 0.3 mg/kg intravenously was used for induction of general anaesthesia for Caesarian section delivery, diazepam concentration in neonate 2 hours after delivery was found to be in the lower range of plasma levels than in adults, a daily therapy with diazepam 15 mg. In small doses, investigators have found minimal foetal and neonatal effects. Although beat-to-beat variability of the foetal heart rate is markedly decreased even small intravenous dose (5-10 mg) [9], there are no adverse effects, on foetal or neonatal acid-base or clinical status. Small doses (2.5 to 10 mg) of intravenous diazepam used as an antianxiety medication in patients undergoing Caesarian section under regional anaesthesia[10] did not sedate the newborn and not alter the acid base status. So small intravenous doses of diazepam (2.5 to 10.0 mg) can help to alley extreme apprehension and anxiety without producing significantly adverse foetal or neonatal effects.

Discussion (Continued)

In the present study the mean age of the study sample in group A was 27.20±2.89 years and in group B was 27.00±4.49 years, mean weight in group A was 57.48±6.27 kg and in group B was 59.28±6.20 kg, and mean height in group A was 152.10±3.58 cm and in group B was 151.40±3.19 cm. There was no significant difference in between the groups (Table-I). Patients in both group A and B showed no difference in APGAR score at 1 minute and 5 minutes after delivery of baby (Table-II), depending on the heart rate respiratory effort, muscle tone, reflex irritability and colour of the neonate. The APGAR score remains the most valuable assessment of the neonate; the 1 minute score completed with survival while 5 minutes score is related to neurological outcome[5].

Anaesthetic requirements are decreased during pregnancy to the experimental animals, minimum alveolar concentration (MAC) for halothane, isoflurane or methoxyflurane is 25 to 40% less in pregnant animals than in nonpregnant animals.[11] Also, the reduced maternal function residual capacity results at a faster rate of equilibration between inspired and alveolar (brain) gas tension. Therefore, the rate of induction of anaesthesia is much more rapid in the pregnant patient, and overdose may easily occur. Most of the inhalation agents used in obstetric anaesthesia cause dose-related depression of uterine contractility. Uterine relaxation may result in increased blood loss following delivery[12] noted a dose-related decrease in resting tension in both pregnant and nonpregnant animal and human myometrium exposed in vitro to halothane. At low concentration, the depressant effect was more profound on myometrium. Inhalation agents, which are more lipid soluble, remain in unionized state and have low molecular weight seems to cross the placental barrier more easily. Anaesthetic levels rise rapidly in the foetal brain and in general the degree of the depth and duration of maternal anaesthesia. Besides the inhalation agents, like halothane, also cause environmental pollution. The abnormality most consistently reported has been an increased incidence of spontaneous abortion among female anaesthetist[13]

From the experience of current study it can be proposed that using diazepam premedication in N_2O+O_2 anaesthesia without using traditional halothane, the chance of postpartum haemorrhage can be avoided.

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