ORIGINAL ARTICLE

Comparison of the effects of general and spinal anaesthesia on APGAR score of the neonates in patients undergoing elective caesarean section

Rumina Tabassum, Saleem Sabbar, Fawad Ahmed Khan, Jan Muhammad Shaikh

Abstract

Objective: The aim of the study was to compare the effects of general and spinal anaesthesia on APGAR score of the neonates in patients undergoing elective caesarean section.

Study design: Randomized control trial

Place and duration of surgery: This study was conducted in Anaesthesia Department of Lyari General Hospital Karachi over a period of 3 months from January 2009 to March 2009.

Patients and methods: In this study 100 patients, who were on operation theatre list for caesarean section, were divided into two groups. Group I (n=50) received spinal anaesthesia and group II (n=50) received general anaesthesia. There were no significant differences in age, height and weight of the patients. Data from the patients was recorded on a proforma. The comparison was made between groups I and group II. After delivery of the neonate the APGAR was assessed at 1 and 5 minutes and was documented on proforma.

Result: In group I, the average age of the patients was 29.15±5.62 while in group II the average age was 28.72±5.62; the mean difference was not statistically significant between groups (P=0.67). Mean weight of the patients in group I was 70.64±10.16 kg and 72.46±12.62 kg in group II. At 1 and 5 minutes intervals, APGAR score was found higher in neonates of women who received spinal anaesthesia than those women who received general anaesthesia (P<0.001). The higher percentage of patients in group I showed quite improved APGAR score as compared to patients in group II.

Conclusion: Neonates of women showed improved APGAR score who had caesarean section in spinal anaesthesia than in general anaesthesia.

Key Words: APGAR score, Spinal Anaesthesia, General Anaesthesia, Neonates

Dow International Medical College, Dow University of Health Sciences, Karachi
R Tabassum

Department of Anaesthesia and ICU, Dow International Medical College, Dow University of Health Sciences, Karachi.
S Sabbar

Sindh Govt Lyari General Hospital, Karachi.
FA Khan

Department of Anaesthesiology and Intensive Care, Liaquat University of Medical and Health Sciences, Jamshoro.
JM Shaikh

Correspondence:
Name: Dr Saleem Sabbar
Address: Dow International Medical College, Dow University of Health Sciences, Karachi.
Cell: 0333-3392043

Introduction

General and regional anaesthesia, like spinal or epidural techniques, can be employed for caesarean section. Maternal and neonatal outcome is influenced by type of anaesthesia adopted. International obstetric guidelines recommend spinal and epidural over general anaesthesia for most caesarean sections [1,2]. The primary reason for recommending regional blocks is the risk of failed endotracheal intubation and aspiration of gastric contents in pregnant women who undergo general anaesthesia [3]. There is evidence that general anaesthesia is associated with an increased need for neonatal resuscitation [4]. The spinal anaesthesia is commonly considered as more practical, safe and cheaper than other techniques like general and epidural anaesthesia. It is simple to administer and minimal amount of monitoring is required besides it gives better foetal outcome in case of caesarean section.

In general anaesthesia most of the drugs can affect the baby either by the direct effect from pla-

cental transfer or by indirect effect due to maternal physiological and biochemical changes Drugs required for general anaesthesia are multiple and may produce systemic effects in the baby resulting in low APGAR score and sedation. General anaesthesia poses risk of difficult intubation and may ensue into maternal pulmonary aspiration, delayed recovery, nausea and vomiting. The incidence of maternal mortality is 10 %. [5]

Hyperbaric 0.75 % bupivacaine 1.5 ml is used to induce spinal anaesthesia which is unlikely to produce any systemic effect in the baby. Other advantages of spinal anaesthesia include less neonatal exposure to depressant drugs, a decreased risk of maternal pulmonary aspiration and awake mother at the birth of child. As with any regional technique the disadvantages are risks of an extensive block, the fixed duration of anaesthesia, hypotension and risk of postdural puncture headache.[6,7]

Previous studies have shown that neonates delivered, after general anaesthesia, had higher incidence of low APGAR score when compared with spinal anaesthesia. This study was conducted to assess the safer mode of anaesthesia for elective caesarean section in term of neonatal outcome.

Patients and methods

This study was conducted in anaesthesia department of Sindh Govt Lyari General Hospital, Karachi after approval from competent authority, over a period of 3 months, from January 2009 to March 2009. Hundred patients belonging to ASA I, undergoing elective caesarean section, were included. Informed consent was taken from the patients at pre-anaesthetic visit. Following patients were included and excluded.

Inclusion criteria

1. Elective Caesarean section (36-40 weeks)
2. ASA I
3. Singleton pregnancy
4. Adequate liquor

Exclusion criteria:

1. Refusal from patient
2. History of local anaesthetic allergy
3. Emergent cases
4. Patients with coagulation abnormalities
5. Infection at lumbar puncture site
6. Skin to uterine incision time > 10 minutes
7. Uterine incision to delivery time >3 minutes
8. Babies small for dates

These 100 patients were divided into two groups: Group I and group II. Group I (n=50) received spinal anaesthesia and group II (n=50) received general anaesthesia. Patients were reassured, upon arrival in Operation Theater, to reduce their anxiety.

In group I, after Intravenous access and application of monitors, base line readings of heart rate and blood pressure were recorded. Ringers lactate was used to preload the patients which were given according to body weight of the patient (15ml/kg). After explaining the procedure and taking all aseptic precautions, patient was placed in sitting or lateral position. Interspinous space between L2/L3 or L3/L4 was identified and skin overlying was infiltrated with 2 % lidocaine. 25 G spinal needle was then introduced between interspinous space L3 and L4 and after confirming its intrathecal position by observing clear outflow of CSF, 1.5 ml of 0.75% hyperbaric bupivacaine was injected. After removing spinal needle, sterile dressing was applied and patient was put in supine position. Blood pressure and heart rate readings were recorded after regular time intervals.

In group II, after Intravenous access and application of monitors, patients were given general anaesthesia using standardized method through investigator.

After delivery of the neonate the APGAR score was assessed at 1 and 5 minutes and was documented on proforma.

Statistical Analysis:

Statistical analysis was done using SPSS version 10 on computer. Mean and standard deviation of the quantitative variables like age, weight and

APGAR score, were determined. Independent sample t test was used to compare mean difference between groups for age, weight and Apgar score. P<0.05 was considered significant.

Results

In this study hundred patients, who were on operation theatre list for caesarean section, were divided into two groups. Group I (n=50) received spinal anaesthesia and group II (n=50) received general anaesthesia. In group I the average age of the patients was 29.15±5.62 while in group II the average age was 28.72±5.62; the mean difference was not statistically significant between groups (P=0.67). Mean weight of the patients in group I was 70.64±10.16 and 72.46±12.62 in group II (table 1). APGAR score was found higher at 1 and 5 minutes intervals in neonates of women who received spinal anaesthesia than those women who received general anaesthesia (P<0.001) (table 1). The percentages of patients with different APGAR scores at 1 and 5 minutes are also mentioned in table 2. The higher percentage of patients in group I showed quite improved APGAR score as compared to patients in group II.

Discussion

The spinal anaesthesia may be preferred to general anaesthesia in caesarean section in terms of better APGAR score and earlier initiation of breast feeding. Maternal satisfaction was found higher with epidural than with spinal anaesthesia for elective caesarean section. [8]

Since general anaesthesia was responsible for most of the low APGAR neonates born by elective Caesarean section as a result of which greater use of spinal anaesthesia for elective caesarean section was recommended [9]. Many studies found significant differences between spinal and general anaesthesia, the spinal anaesthesia had the most favourable outcome.[10]

Koltat et al in prospective, randomized trial of effect of anaesthesia on neonates found APGAR scores of the neonates whose mothers received general anaesthesia lower than in neonates whose mothers received regional anaesthesia.[11]

Two other studies in Khartoum and Canada also found general anaesthesia associated with a higher incidence of low APGAR scores at 1 minute. There was no difference seen in neonatal death rate with general and regional anaesthesia.

Wallace et al in a prospective randomized trial of anaesthesia, compared general anaesthesia with combined epidural spinal anaesthesia for caesarean section. There was no significant difference in maternal neonatal morbidity among the groups. [12]

A retrospective study by Hood et al [13] and a prospective study by Sharwood-Smith et al [14] agreed with these findings. General anaesthesia for emergency caesareans can contribute to poorer baby and maternal outcomes and regional anaesthesia is generally recommended. [15, 16]

In our study APGAR score was not influenced by maternal age and gender of the baby but was higher in neonates of women who received spinal anaesthesia.

Since there are various factors affecting APGAR score like induction to delivery time, incision to delivery time, baby weight and duration of pregnancy. apart from type of anaesthesia. So further studies are required to address the forementioned variables.

Conclusion

Neonates of women showed improved APGAR score who had caesarean section in spinal anaesthesia than in general anaesthesia.

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CORRIGENDUM

Waraich S, Naqvi Z. Comparision of intravaginal misoprostol and dinoprostone for induction of labour. Pak J Surg 2009; 25(3): 209-13.

The title of paper should read "Comparision of intravaginal misoprostol and dinoprostone for induction of labour".

The editor regrets the error.