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Efficacy of lignocaine on bispectral index in patients undergoing caesarean section under spinal anaesthesia

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Abstract

Background: The present study was conducted to assess the effect of the infusion of lignocaine on the bispectral index in patients undergoing caesarean section under spinal anaesthesia.

Materials and Methods: 104 female patients age ranged 18-40 years with ASA physical status of I or II scheduled for elective caesarean section under spinal anaesthesia were recruited. Patients were divided into 2 groups of 52 each. Group I received intravenous 1.5 mg/kg of lignocaine bolus and group II patients were given 0.9% sodium chloride. The changes of Sao₂, BIS and adverse effects were recorded.

Results: The mean age of patients in group I was 34.5 years and in group II was 30.8 years, weight was 65.2 kgs and in group II was 66.1 kgs and duration of surgery was 82.3 minutes and in group II was 85.1 minutes. BIS index in group I was significantly less at 30 minutes, 40 minutes, 50 minutes, 60 minutes ($P < 0.05$) as compared to group II. Common side effects in group I was shivering seen in 3 and 4 in group II, nausea 5 in group I and 6 in group II and ephedrine requirement seen 2 in group I and 3 in group II.

Conclusion: Intravenous lignocaine infusion given with spinal anaesthesia in females undergoing elective caesarean delivery provided lower BIS values as compared to normal saline group.

Keywords: Caesarean, lignocaine, spinal anaesthesia

Introduction

Pain after Cesarean delivery is a common occurrence on the labor and delivery unit ^[1]. The increased use of neuraxial anesthesia has allowed the administration of neuraxial opioids to help with postoperative pain control. Many patients, however, still require IV and oral opioids in the post anesthesia recovery unit (PACU), and on the postpartum nursing floor ^[2]. Post Cesarean delivery pain not only has the usual adverse effects common to all postoperative pain (i.e. increased risk for deep vein thrombosis, pulmonary embolism, coronary ischemia, pneumonia, poor wound healing, and psychological dysfunction) but also has the potential to adversely affect mother-baby bonding, time spent in skin-to-skin contact and success of initiating effective breastfeeding ^[3].

Systemic administration of lidocaine has been shown to decrease opioid consumption, improve recovery of bowel function and promote a better recovery after inpatient procedures ^[4]. Lidocaine has been shown to have analgesic, antihyperalgesic and anti-inflammatory properties. It also has an excellent safety profile when given by a low-dose infusion ^[5].

The depth of sedation could be monitored with clinical criteria. But observer-based (e.g., observer's assessment of awareness/sedation (OAA/S) score has the disadvantage of frequent patient stimulation, which may alter the actual level of sedation ^[6]. Nevertheless, the bispectral index (BIS) provides a continuous objective assessment without patients involvement ^[7]. The present study was conducted to assess the effect of the infusion of lignocaine on the bispectral index in patients undergoing caesarean section under spinal anaesthesia.

Materials and Methods

The present study was conducted on 104 female patients age ranged 18-40 years with ASA physical status of I or II scheduled for elective caesarean section under spinal anaesthesia were recruited. All were enrolled after obtaining their written consent. Ethical approval was obtained before starting the study.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 52 each. Group I received intravenous 1.5 mg/kg of lignocaine bolus, 15 minutes before spinal anaesthesia followed by an intravenous infusion 1.5 mg/kg/h for 60 minutes intravenously.

Group II patients were given 0.9% sodium chloride. Spinal anaesthesia was performed with 10mg of 0.5% bupivacaine. The changes of Sao2, BIS and hemodynamic variables during caesarean section, Apgar score of neonate and the incidence of adverse effects were recorded. Results were tabulated and subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table 1: Demographic data in both groups

Parameters	Group I	Group II	P value
Age (Years)	34.5	30.8	0.08
Weight (Kgs)	65.2	66.1	0.91
Duration of surgery (Minutes)	82.3	85.1	0.94

Table I shows that mean age of patients in group I was 34.5 years and in group II was 30.8 years, weight was 65.2 kgs and in

group II was 66.1 kgs and duration of surgery was 82.3 minutes and in group II was 85.1 minutes. The difference was non-significant ($P>0.05$).

Table 2: Comparison of BIS index in both groups

Duration (Minutes)	Group I	Group II	P value
10	96.1	96.8	0.98
20	95.2	96.2	0.94
30	90.4	97.3	0.02
40	88.6	97.1	0.001
50	84.3	98.2	0.001
60	90.2	98.4	0.05
70	94.6	97.3	0.06
80	96.4	97.2	0.14

Table II, graph I shows that BIS index in group I was significantly less at 30 minutes, 40 minutes, 50 minutes, 60 minutes ($P<0.05$) as compared to group II.

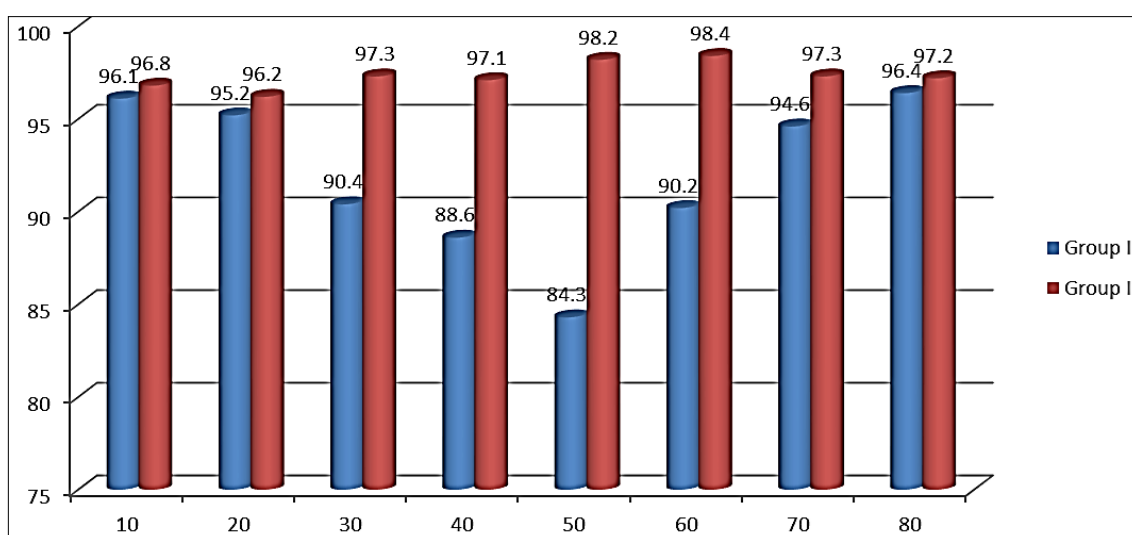


Fig 1: Comparison of BIS index in both groups

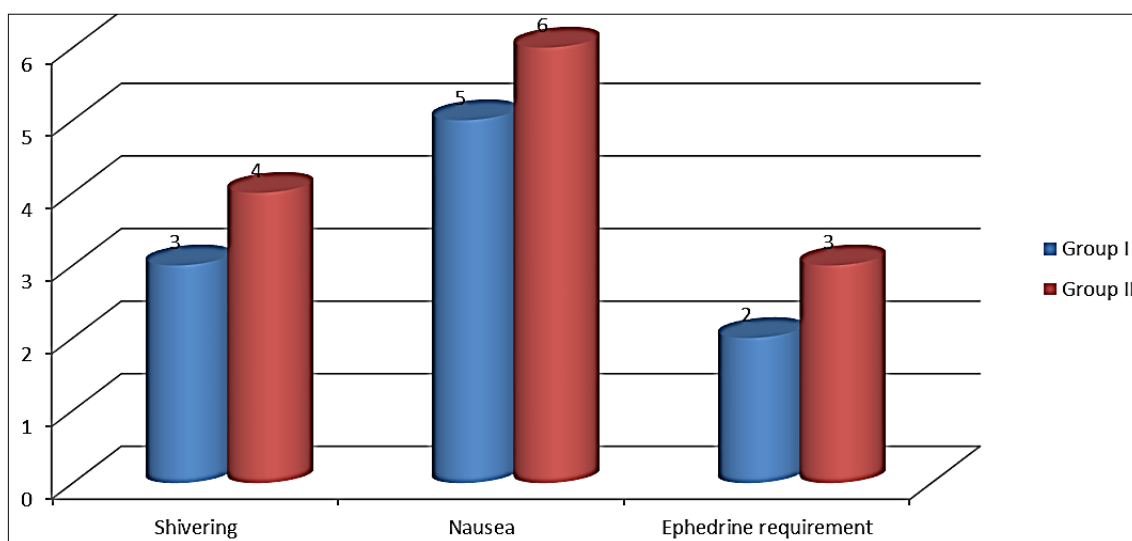


Fig 2: Comparison of side effects

Graph II shows that common side effects in group I was shivering seen in 3 and 4 in group II, nausea 5 in group I and 6 in group II and ephedrine requirement seen 2 in group I and 3 in group II. The difference was significant ($P<0.05$).

Discussion

Supplementation of spinal anaesthesia with sedatives or anxiolytics has emerged as a routine practice to improve patient satisfaction without affecting fetal and neonatal outcomes [8].

Systemic lignocaine has been shown to have sedative effects and also, some investigators supposed that, the hypnotic-sparing effect of lignocaine occur only during surgical stimulation, suggesting an anti-nociceptive effects^[9]. The present study was conducted to assess the effect of the infusion of lignocaine on the bispectral index in patients undergoing caesarean section under spinal anaesthesia.

In present study, we enrolled 104 women age group 18-40 years planned for cesarean section. Group I received intravenous lignocaine and group II patients were given sodium chloride. Khezri *et al.*^[10] conducted a study in which 80 patients scheduled for elective caesarean section under spinal anaesthesia were randomly allocated to 2 study groups. Group L received intravenous 1.5 mg/kg of lignocaine bolus and the patients in the control group (C group) were given 0.9% sodium chloride in a double-blind fashion. BIS values were lower in the L group compared to C group ($P \leq 0.001$). Comparison of mean arterial pressure (MAP) changes during spinal anaesthesia and surgery reveal statistically significant difference between two groups through repeated measure analysis ($P \leq 0.001$), but comparison of heart rate (HR) changes during spinal anaesthesia and surgery failed to reveal any statistically significant difference between two groups. ($P=0.261$). The Apgar scores did not reveal a significant difference between the two groups at first and five minutes after delivery ($P=0.99$).

We found that mean age of patients in group I was 34.5 years and in group II was 30.8 years, weight was 65.2 kgs and in group II was 66.1 kgs and duration of surgery was 82.3 minutes and in group II was 85.1 minutes. Luo *et al.*^[11] in their studies reported that systemic lignocaine did not diminish or abolish the brain response to acute noxious electric stimulation based on functional magnetic resonance imaging on rats. However, most of the other studies have shown that lignocaine has sedative effects in the central nervous system, so it can be used as an anaesthetic adjunct during general anaesthesia.

Pradhan *et al.*^[12] compared the effect of the drugs, intraoperative hemodynamic variables (heart rate, blood pressure) and associated complications (hypotension, nausea, shivering etc.) between the bupivacaine and lignocaine group, when administered intrathecally in patients undergoing caesarean section. The patients were randomly divided in two groups, group X (lignocaine group, n=26) or group B (bupivacaine group, n=26), either to receive 5.0% lignocaine 75 mg or 0.5% bupivacaine 12.5 mg. Intraoperatively heart rate, blood pressure (systolic (SBP), diastolic (DBP) and mean (MAP)), oxygen saturation were monitored. Any rescue drugs e.g. mephentermine, crystalloid 200 ml bolus, pethidine, diazepam etc. given were noted with the dose and time. Urine output and total amount of fluid given was noted at the end of the surgery. Oxytocin 10 U in infusion was given after the baby was delivered in all the cases. Intraoperative blood pressures, total amount of fluid given, rescue vasopressor (mephentermine) given were compared in both the groups. Groups were also compared with respect to the patients' age, height of sensory block, motor block, duration of surgery, Apgar score and weight of the baby and duration of postoperative analgesia.

The shortcoming of the study is small sample size.

Conclusion

Authors found that intravenous lignocaine infusion given with spinal anaesthesia in females undergoing elective caesarean delivery provided lower BIS values as compared to normal saline group.

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