

The Efficacy of the Spinal Anesthesia during Emergency Cesarean Section for Severe Preeclampsia and Eclampsia Patients

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Abstract

Background: The most common causes of prenatal morbidity and death in Bangladesh are eclampsia and severe preeclampsia or toxemia (PET). Obstetricians and anesthesiologists have complex challenges while dealing with this condition. Despite the improved result of spinal anesthesia over general anesthesia, general anesthesia is still routinely used for emergency LUCS in underdeveloped nations. More and more people in industrialized nations, such as the United Kingdom and the United States, recognize spinal anesthesia for its safety. **Objective:** In this study our main aim is to evaluate the efficacy of the Spinal Anesthesia during Emergency Cesarean Section for Severe Preeclampsia and Eclampsia Patients. **Method:** This cross-sectional study was carried out at tertiary medical hospital from January 2020 to January 2021. Total 200 cases of severe PET (n=110) and eclampsia (n=100) patients were selected by subarachnoid block for emergency LUCS. Each patient was given magsulph as prophylactic or maintenance dose and judiciously preloaded by crystalloid fluid. **Results:** Most of the patients belong to 31-40 years age group, 55% and 95.8% cases were multigravida. In severe PET group, intraoperative hypotension was observed in 32% cases and postoperative period hypotension was observed in 8% cases. Whereas preeclampsia group, intraoperative hypotension was observed in 31% cases and postoperative period hypotension was observed in 9% cases. In addition, maternal morbidity where acute renal failure seen in 5%, syndrome 7%, DIC 7%, abruptio placentae 12%, pulmonary edema 4%, septicemia 13%, PPH 10% and postpartum eclampsia 15%. In severe PET group, 21% cases transferred to eclampsia ward, followed by 9% shifted to ICU, 1% case was expired. Whereas, in preeclampsia group 20% cases transferred to eclampsia ward, followed by 8% shifted to ICU, 2% case was expired. In eclamptic group 7% cases were transferred to NCU, whereas 8% had PET. Neonatal mortality was observed in 3% cases. p value was found 0.000 which is very highly significant. **Conclusion:** With close monitoring of perioperative events, spinal anesthesia may be used as a safe alternative technique to GA or epidural in severe preeclampsia and eclampsia, even in cases of altered consciousness or restlessness in the presence of an expert and skilled anesthesiologist, reducing perioperative maternal and neonatal morbidity and mortality.

Keywords: Severe Preeclampsia (PET) Eclampsia, spinal anesthesia.

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INTRODUCTION

Due to poverty, illiteracy, lack of education, lack of transport facility, availability of well-equipped antenatal clinic, HDU, ICU facility, and delay in hospital admission, severe preeclamptic toxemia and eclampsia pose a significant challenge to anesthesiologists and obstetricians in our country [1-4].

House-to-house surveys in Bangladesh reveal an alarmingly high rate of eclampsia (7.9%, not counting preeclampsia). Only 2.3% of women in the United States have access to obstetric care, and of those, only 1% receives it during their whole pregnancy.

Therefore, most instances of PE are not diagnosed until they progress to more severe stages like

eclampsia. Preeclampsia and eclampsia affect around 5% of births in Bangladesh.

Eclampsia is the cause of mortality in between 9 and 16 percent of all mothers. Controlling seizures and hypertension, terminating the pregnancy, and providing comprehensive nursing care are the cornerstones of treating severe PET and eclampsia and reducing the risk of harm to the mother and her unborn child. LUCS requires a safe method of early pregnancy termination under anesthesia.

Though there are many debates about the best approach for LUCS in severe PET and eclampsia patients, SAB is superior to GA [5, 6]. Even though there is a risk of spinal-induced hypotension, SAB is preferred simply to avoid the hazards of GA such as laryngoscopic-induced hypertension during intubation and extubation, difficult intubation, failed intubation, esophageal intubation, pulmonary aspiration, risk of cerebral hemorrhage, drug interaction between magsulph and non-depolarizing muscle relaxant (NDMR), delayed recovery or reversal hazards, drug-related issues [7-9]. In this study our main aim is to evaluate the efficacy of the Spinal Anesthesia during Emergency Cesarean Section for Severe Preeclampsia and Eclampsia Patients.

OBJECTIVE

To assess the efficacy of Spinal Anesthesia during Emergency Cesarean Section for Severe Preeclampsia and Eclampsia Patients.

METHODOLOGY

This cross sectional study was carried out at tertiary medical hospital from January 2021 to January 2022. Total 200 cases of severe PET (n=110) and eclampsia (n=100) patients were selected by subarachnoid block for emergency LUCS. Each patient was given magsulph as prophylactic or maintenance dose and judiciously preloaded by crystalloid fluid. Thiopental sodium 50–100 mg was given to those who had convulsion during SAB. About 2–2.5 mL (10–12.5 mg) 0.5% bupivacaine heavy was used by 25–27 G spinocaine in L3–4 or L4–5 space. After the establishment of the desired block, LUCS was performed. Meticulous monitoring was done and all events were recorded and problems were effectively managed.

Eclamptic parturients, especially with pre-existing chronic hypertension, abnormal renal function, abruptio placentae, are at increased risk of pulmonary edema and exacerbation of severe hypertension. So it is

very necessary to continue the strict observation in the postoperative period. Magsulph was continued for 24 hours after delivery and or for 24 hours following the last convulsion. Hypertension was controlled by using calcium channel blockers, beta blocker or in case of need alpha blockers.

After total recovery from spinal anesthesia, the patient was transferred to Eclampsia Ward or to ICU if necessary. After delivery of the baby and placenta, 5–10 units of oxytocin was given as direct I/V or by 20–30 units in each liter of IV fluid. Apgar score was noted and after primary resuscitation baby was sent to the neonatal unit and transferred to neonatal ICU.

Data were analyzed using SPSS version 20.0. The result was reported as frequency and percentage. Perioperative morbidity and mortality was observed and noted. All patients were monitored until discharged.

RESULTS

In table-1 shows age distribution of the patients where most of the patients belong to 31-40 years age group, 55%. Whereas 45% belong to 21-30 years age group. The following table is given below in detail:

Table-1: Age distribution of the patients

Age group	Percent
21-30 years	45
31-40years	55

In table-2 shows demographic status of the patients where 28.3% just completed their graduation where as 55% was housewife. The following table is given below in detail:

Table-2: Demographic status of the patients

Educational status	Percentage (%)
Primary	12.5%
Secondary	21.7%
SSC	25%
HSC	12.5%
Graduate	28.3%
Occupation	
Housewife	55%
Teacher	25%
Service holder	20%

In figure-1 shows parity distribution where primigravida were 4.2% and multigravida were 95.8% cases. The following figure is given below in detail:

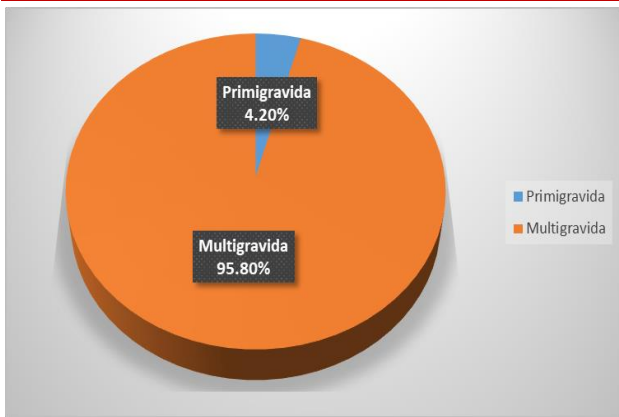


Figure-1: Parity distribution

Table 3 displays intra- and postoperative significant status, revealing that 32% of patients in the severe PET group had hypotension during surgery and 8% did so thereafter. Four percent of patients had hypertension during surgery, while twelve percent did

so thereafter. Seven percent of patients had tachycardia during surgery, whereas twenty-five percent experienced bradycardia. Twenty-five percent of patients had chills during surgery, while another twenty-six percent did so thereafter. Twelve percent of patients experienced nausea and vomiting during surgery, while nine percent did so afterward. However, 31% of the preeclampsia group had hypotension during surgery, and 9% experienced it thereafter. Only 6% of patients were found to have hypertension during surgery, whereas 11% had hypertension after surgery. We discovered that 9% of patients had intraoperative tachycardia and 27% experienced bradycardia. Shivering occurred in 22% of instances during surgery, and in 23% of cases thereafter; nausea and vomiting occurred in 13% of cases during surgery and in 10% of cases after surgery. The following table is given below in detail:

Table-3: Intra- and postoperative significant status

Intra- and postoperative significant status	Severe PET	Preeclampsia
Intraoperative hypotension	32%	31%
Post-operative hypotension	8%	9%
Intra-operative hypertension	4%	6%
Post-operative hypertension	12%	11%
Intra-operative bradycardia	25%	27%
Intra-operative tachycardia	7%	9%
Intra-operative nausea and vomiting	12%	13%
Post-operative nausea and vomiting	9%	10%
Intra-operative shivering	25%	22%
Post-operative shivering	26%	23%

^*Multiple response was noted.

In figure-2 shows maternal morbidity where acute renal failure seen in 5%, syndrome 7%, DIC 7%, abruptio placentae 12%, pulmonary edema 4%,

septicemia 13%, PPH 10% and postpartum eclampsia 15%. The following figure is given below in detail:

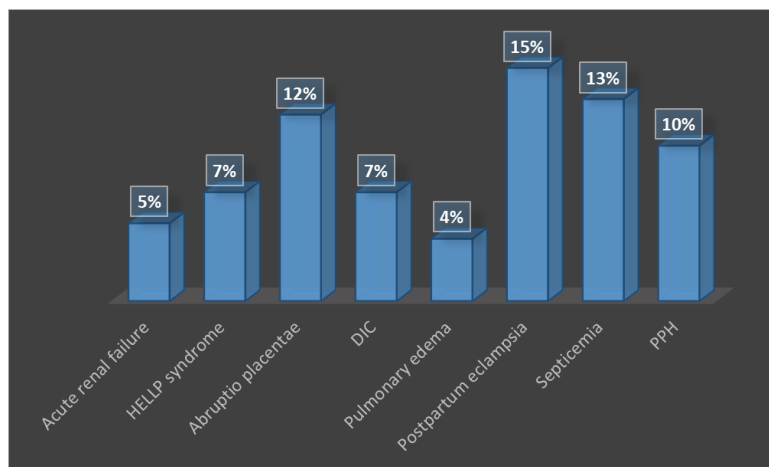


Figure-2: Maternal morbidity

^*Multiple response was noted.

In table-4 shows maternal outcomes where in severe PET group, 21% cases transferred to eclampsia ward, followed by 9% shifted to ICU, 1% case was expired. Whereas, in preeclampsia group 20% cases

transferred to eclampsia ward, followed by 8% shifted to ICU, 2% case was expired. The following table is given below in detail:

Table-4: Maternal outcomes

Maternal outcome	Severe PET,%	Preeclampsia,%
Transfer to Eclampsia ward	21%	20%
Transfer to ICU	9%	8%
Expired	1%	2%

In table-5 shows fetus outcome where Apgar score <7 at 5 minutes in severe PET was observed in 7% and eclampsia in 9% cases. In eclamptic group 7% cases were transferred to NCU, whereas 8% had PET.

Neonatal mortality was observed in 3% cases. P value was found 0.000 which is very highly significant. The following table is given below in detail:

Table-5: Fetus outcome

Fetus outcome	Severe PET, %	Preeclampsia, %
Apgar score <7 at 5 minutes	7%	9%
Transfer NCU	7%	8%
Prenatal death	2%	1%

DISCUSSION

In our study, we found acute renal failure seen in 5%, syndrome 7%, DIC 7%, abruptio placentae 12%, pulmonary edema 4%, septicemia 13%, PPH 10% and postpartum eclampsia 15%.

In one study found 39.1% HELLP syndrome, 3.6% acute renal failure, 8.1% abruptio placentae, 1.8% neurological deficit, 8.8 % intensive care unit referral [9].

Another study found 10% abruptio placentae, 11% HELLP syndrome, 6% DIC, 5% pulmonary edema, 4% acute renal failure, 4% cardiac arrest and 1% death [10].

The major side effects of spinal anesthesia are hypotension, decreased cardiac output resulting in placental hypoperfusion and poor perinatal outcomes as well as the risk of iatrogenic pulmonary edema due to bolus intravenous fluid administration during treating spinal-induced hypotension [11].

But the hypotensive side effects are usually less in eclamptic and severe preeclampsia patients than in normal pregnant or non-pregnant women, which may be due to having high level of catecholamines and persisting vasoconstriction effect as a consequence of imbalance between pro- and antiangiogenic growth factors followed by vascular epithelium damage [12].

However, in severe PET group, intraoperative hypotension was observed in 32% cases and postoperative period hypotension was observed in 8% cases. Intraoperative hypertension was observed only in 4% patients and in postoperative period 12% cases were found. Intraoperative tachycardia was found in 7%

cases and bradycardia was observed in 25% cases. Intraoperative shivering was observed in 25% cases, postoperative shivering was observed in 26% cases, intraoperative nausea and vomiting were observed in 12% cases and postoperative nausea and vomiting were observed in 9% cases. Whereas preeclampsia group, intraoperative hypotension was observed in 31% cases and postoperative period hypotension was observed in 9% cases. Intraoperative hypertension was observed only in 6% patients and in postoperative period 11% cases were found. Intraoperative tachycardia was found in 9% cases and bradycardia was observed in 27% cases. Intraoperative shivering was observed in 22% cases, postoperative shivering was observed in 23% cases, intraoperative nausea and vomiting were observed in 13% cases and postoperative nausea and vomiting were observed in 10% cases.

Whereas, other study found hypotension in 47.1% cases after giving spinal anesthesia [13].

Several studies show that death rate is more following general anesthesia. In India, a study published in the Journal of Pregnancy in 2014 found higher mortality (25.9%) in general anesthesia group than spinal (1.4%) anesthesia [14].

In our study severe PET group, 21% cases transferred to eclampsia ward, followed by 9% shifted to ICU, 1% case was expired. Whereas, in preeclampsia group 20% cases transferred to eclampsia ward, followed by 8% shifted to ICU, 2% case was expired.

Whereas Apgar score <7 at 5 minutes in severe PET was observed in 7% and eclampsia in 9% cases. In eclamptic group 7% cases were transferred to NCU, whereas 8% had PET. Neonatal mortality was observed in 3% cases. P value was found 0.000 which is very

highly significant. Which was similar to other studies [12, 13].

In the presence of a competent, experienced, and qualified anesthesiologist, it may be advised as a safe alternative treatment in severe preeclampsia and eclampsia, despite the patient's altered consciousness or semiconscious, restless, or unstable state. Establishing a dedicated eclampsia ward with state-of-the-art intensive care units is necessary to decrease maternal and newborn mortality after surgery.

CONCLUSION

With close monitoring of perioperative events, spinal anesthesia may be used as a safe alternative technique to GA or epidural in severe preeclampsia and eclampsia, even in cases of altered consciousness or restlessness in the presence of an expert and skilled anesthesiologist, reducing perioperative maternal and neonatal morbidity and mortality.

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