ORIGINAL ARTICLE

Evaluation of Haemodynamic Effects of Spinal and Epidural Anaesthesia for Caesarean Section - A Comparative Study

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ABSTRACT

Background: Cesarean section is a common mode of child delivery world-wide. Various forms of anaesthesia have been used to perform this surgery. However, the use of general anaesthesia has fallen dramatically in the past few decades due to some risks associated with general anaesthesia that can be avoided with regional anaesthesia. Objective of this study was to assess the relative efficacy and side-effects of two varieties of regional anaesthesia – spinal anaesthesia vs epidural anaesthesia in caesarean section.

Methods: This descriptive type of observational study was carried out at Department of Anaesthesiology, ICU and Pain Medicine, Shaheed Ziaur Rahman Medical College Hospital, Bogura, Bangladesh from 26th August 2018 to 25th February 2019. Sample was selected by non-probability (purposive) sampling technique in two group distributed as - Group-S (Spinal group, n= 30) and Group-E (Epidural group, n=30). The patients with ASA grade I and II those underwent elective caesarean section was selected after careful history taking, thorough clinical examination and appropriate investigations for checking the inclusion and exclusion criteria.

Results: In this study majority of the patients i.e. 81.6% (n=49) were between 18-24 years, mean±SD age was found to be 23.8±10.2 years. No significant difference was found between groups with respect to age. Group S, 19(63.3%) were ASA I and 11(36.6%) were ASA II. Group E, 18(60%) were ASA I and 12(40%) were ASA II. Present study demonstrated that spinal anaesthesia has a shorter onset time. The “Onset of Anaesthesia” time in the S group was significantly shorter than in the E group (S=8.6±2.8 minutes versus E=11.2±4.1 minutes, respectively). Regarding the heart rate, no significant difference was detected between the groups. Compared with group S patients, group E patients showed slight but statistically non-significant increased heart rate at the 10 min time (80 & 92 beat/min respectively). So, at the end of follow up we found that heart rate almost stabilized in both spinal & epidural groups. Although hypotension episodes were more frequent in the spinal anaesthesia group at 5th, 10th & 15th minute time. After anaesthesia, significant decrease in MAP was seen in both groups compared with basal MAP, the highest fall was in the group S and least decrease occurred in the group. MAP at 5th minute was 67.90±9.5 & 73.45±8.2 mm of Hg in group S & group E respectively – showing significant difference (p=0.0001). Present study shows that duration of motor block was 192.48 min and 130.60 min in group S and Group E respectively. Sensory block was 212.48 min and 326.60 min in group S and Group E respectively. In the spinal group (Group-S), seven (7) patients had nausea and three (3) of them experienced episodes of vomiting. None of the patients in the group-E experienced vomiting, only two patients noticed nausea. Twelve (12) patients in the S group and three (3) patients in the E group had hypotension (p = 0.03).

Conclusion: Although both spinal and epidural techniques provide effective anaesthesia for caesarean section, spinal anaesthesia for caesarean section seems to be advantageous due to simplicity of administration, rapid onset of anaesthesia and increased density of spinal anaesthetic block.

Keywords: Caesarean Section, Spinal Anaesthesia, Epidural Anaesthesia, Haemodynamics.

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INTRODUCTION

General goals in choosing anaesthesia are - safety of the mother, safety of the baby, and ability to perform the surgery. There are two general categories of anaesthesia for Caesarean section (CS) - General Anaesthesia and Regional Anaesthesia. And, the

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regional anaesthesia includes both spinal and epidural techniques [1]. Obstetric Anaesthesia has evolved substantially in the last two decades, with regional techniques becoming increasingly popular for Caesarean Section. Regional Anaesthesia (spinal or epidural anaesthesia) for elective caesarean section is often the preferred option of caregivers when balancing risks and benefits to the mother and her fetus[2]. Spinal anaesthesia is a reliable and easily learned technique involving a definite end-point (cerebrospinal fluid [CSF]). In 1946, Ullery commented, "As the technique consists essentially in making and maintaining a spinal puncture, even the occasional operator can perform it easily." In spinal anaesthesia, also known as a spinal block, the medication is injected closer to the spinal cord: into the cerebrospinal fluid in the subarachnoid space. This causes the entire lower half of the body to feel numb. Spinal blocks work faster than epidurals, and a smaller amount of anesthetic medication is needed [3]. In an epidural, the anesthetic is injected into the epidural space surrounding the spinal cord in the thoracic or lumbar regions of the spine. This only numbs the nerves that lead to the region of the spinal cord where the anesthetic was injected. Epidurals start relieving pain after 10 to 20 minutes [4]. Most anesthesiologists prefer the method of leaving the epidural tube in situ for emergency CS in parturient with epidural labor analgesia who failed to deliver vaginally. Some anesthesiologists still use spinal anaesthesia (SA) instead of EA not only for its rapid onset and adequate motor blockade but also because of the high failure rate of EA in scheduled CS [5]. However, SA following EA might result in an unexpected high-level blockade or even total SA, although there is no statistical difference compared to SA only. Although regional anaesthesia has several advantages such as preservation of consciousness, avoidance of neonatal depression that occurs with general anaesthesia, and avoidance of airway manipulation, it is contraindicated in conditions of hypovolemia, coagulopathies, infection at the site of injection and when the patient rejects the procedure. Some complications have been associated hypotension, post dural puncture headache (if spinal anaesthesia is used) local anesthetic toxicity (involving central nervous system, cardiovascular system), high spinal, total spinal anaesthesia (if inadvertent injection occurs during epidural injection), bradycardia and failed block [1]. Women who have an epidural or a spinal block occasionally experience a sudden major drop in blood pressure. The advantage of epidural over spinal anaesthesia is the ability to maintain continuous anaesthesia after placement of an epidural catheter, thus making it suitable for procedures of long duration such as labor and delivery. Moreover, epidural anaesthesia technique prevents introduction of Infection to CSF, which is a much common risk in spinal anaesthesia technique. Some anesthesiologists still use spinal anaesthesia (SA) instead of epidural anaesthesia (EA) not only for its rapid onset and adequate motor blockade but also because of the high failure rate of EA in scheduled CS. Therefore, the present study was conducted in an effort to compare the hemodynamic changes in patients undergoing regional anaesthesia for Caesarean section.

MATERIALS & METHODS

This descriptive type of observational study was carried out at Department of Anaesthesiology, Shaheed Ziaur Rahman Medical College Hospital, Bogura, Bangladesh from 26th August 2018 to 25th February 2019. During the study period, 60 consecutive patients of ASA status I or II, were enrolled suitable for the study. Sample was selected by non-probability (purposive) sampling technique in two group distributed as – "Group-S" (Spinal group, n= 30) and "Group-E" (Epidural group, n=30). The patients with ASA grade I or II undergone elective caesarean section was selected after careful history taking, thorough general and systemic examination and appropriate investigations fulfilling inclusion and exclusion criteria.

Inclusion criteria:

a) Patients of Single pregnancy undergoing elective caesarean section with ASA physical status I, II.
b) Informed consent for inclusion in the study.

Exclusion criteria:

a) Patients with coagulopathy, abruptio placentae, placenta previa, HELLP syndrome, pulmonary oedema, cord prolapse and severe fetal distress.
b) Contraindications to regional anaesthesia, e.g.: allergy to local anesthetics, coagulation disorder
c) Unwilling to participate in study.

Study procedure: History, physical examination and pre-anaesthetic checkup were done meticulously. Written informed consent was obtained from each subject, and the study protocol was approved by the Ethical Committee of our Medical College. Randomization was based on a computer-generated code that prepared at a remote site and sealed in opaque, sequentially numbered envelopes. The patients randomly divided into 2 groups: Group-S (Spinal group,

n=30) and Group-E (Epidural group, n=30). On arrival in the operation room, baseline measurements of systolic arterial pressure (SAP), diastolic arterial pressure (DAP) and heart rate (HR) was calculated. After arrival to the operating theatre, all patients were inserted an 18-gauge venous cannula in the largest apparent vein on the dorsum of hand. Then all patients started Lactated Ringer's solution, infused at 15 ml/kg/h before spinal anaesthesia as preload. The ambient temperature was maintained at 22-24 ^{0}C. Baseline parameters like BP, Pulse, Oxygen Saturation and axillary temperature were recorded before anaesthesia given. Spinal anaesthesia was administered with the patient in the sitting position. After skin infiltration with lidocaine, a 25-gauge Whitacre needle was inserted at the L_{2-3} or L_{3-4} vertebral interspace and hyperbaric 0.5% bupivacaine 2 ml to 3ml injected intrathecally. The patient then immediately turned supine with left lateral tilt. Oxygen 2 L/min was given by nasal cannula until delivery. After delivery of the baby, the infusion rate was then slowed to 5 ml/kg/h rate up to the completion of rectus closure and then the infusion rate was slowed to minimum rate required to maintain vein patency.

Epidural catheterization was performed only by attending anaesthesiologists or senior residents using an 18-gauge Tuohy needle and a 20-gauge catheter. For our standard dose of EA for CS, 2% lidocaine only is added or mixed with 0.5% bupivacaine to a total of (15-20) ml. Whether to combine additional agents such as sodium bicarbonate, epinephrine, or opioid is determined by the attending anesthesiologist.

All study medications were administered by an anaesthesiologist not be involved in the care of the patient or collection of data. Systolic arterial pressure, Diastolic arterial pressure and heart rate were recorded at 5-min intervals. The baseline SAP, DAP and HR, lowest and highest SAP, DAP and HR, nausea, vomiting, dizziness, and chest symptoms was recorded every time. Mean arterial pressure (MAP) was calculated by DAP+$^1/_3$ Pulse Pressure (PP) formula. Upper sensory level of anaesthesia was measured by assessing loss of pinprick discrimination at 10 min. All blocks extended to T_5 or above, before surgery was allowed to start.

Data regarding the highest dermatome level of sensory blockade, the time to reach this level from the time of injection, the time to the sensory level regression, time to urination, and incident of side effects were recorded. Appearance of hypotension, bradycardia or any complication recorded and managed accordingly. If blood pressure decreased by more than 30% of baseline and heart rate dropped to less than 50 beats/min, the patient was considered to suffer from hypotension or bradycardia, respectively. The hypotension was managed by rapid IV infusion of 250 mL of lactated Ringer's solution, Left Lateral Tilt and trendelenburg positioning of the patient. Bradycardia was managed using 0.5-1 mg of intravenously administered atropine. If the hypotensive patient did not respond to treatment, ephedrine 5 mg was injected. All collected questionnaire checked very carefully to identify the error in the data. Data processing work was consisted of registration schedules, editing computerization, preparation of dummy table, analyzing and matching of data.

Data analysis: Data were collected in questionnaire. Data processing work consists of registration schedules, editing computerization, preparation of dummy table, analyzing and matching of data. After collection of all information, these data were checked, verified for consistency and edited for finalized result. After editing and coding, the coded data directly entered into the computer by using SPSS version 6. Data cleaning validation and analysis was performed using the SPSS/PC software and graph and chart by MS excel.

RESULTS

Age distribution was found that majority of the patients i.e. 81.6% (n=49) were between 18-24 years and 18.3% (n=11) were between 25-30 years. Mean±SD age was found to 23.8±10.2years. Comparison was done by Chi-Square (χ^2) test. No significant differences were found between groups with respect to age.

Table-1: Age distribution of the patients (n=60)

Age (years)	Number of patients		Total (%)
	Group S (n=30)	Group E (n=30)	
18-24	23(76.6%)	26(86.6%)	49(81.6%)
25-30	7(23.3%)	4(13.3%)	11(18.3%)
Mean ± SD of age was 23.8±10.2.			

There was no significant difference between the groups (p=0.790). Comparison was done by Chi-Square (χ^2) test. All 60 enrolled patients were randomized to groups, 30 patients of each. All patients were with ASA physical status I and II. Group S, 19 (63.3%) were ASA I and 11 (36.6%) were ASA II. Group E, 18 (60%) were ASA I and 12 (40%) were ASA II.

Table-2: American Society of Anesthesiologist (ASA) physical status (n=60)

Status	Number of Patient		P value
	Group S (n=30)	Group E (n=30)	
ASA I	19 (63.3%)	18 (60%)	0.790
ASA II	11 (36.6%)	12 (40%)	

Table-3 shows maternal complications and factors influencing LUCS. On comparison between groups, no significant difference was seen. The most common indication for caesarean section was mild fetal distress (about 19 patients), followed by PROM (14 cases), pre-eclampsia (14 cases), prolong labour (11 cases) etc.

Table-3: Indications and factors influencing the LUCS (n=60)

Indication of LUCS	Group S (n=30)	Group E (n=30)
	n (%)	n (%)
Pre-eclampsia	8 (26.6)	6 (20.0)
Macrosomia, H/O GDM	4 (13.3)	0 (0)
Mild Fetal distress	9 (30.0)	10 (33.3)
Malpresentation	3 (10.0)	5 (16.7)
Prolong labour	6 (20.0)	5 (16.7)
PROM	8 (26.6)	6 (20.0)
Polyhydroamnions	5 (16.7)	2 (6.7)
Oligohydroamnions	4 (13.3)	7 (23.3)

Multiple respondents

Present study shows that, 37-38 week of gestation was 26 (86.7%) women in group S and 24 (80.0%) in group E. Mean period of gestation revealed that 37.3+0.4 weeks and 37.8+0.5 weeks in group S and in group E respectively. The difference was not statistically significant (p>0.05) between two groups.

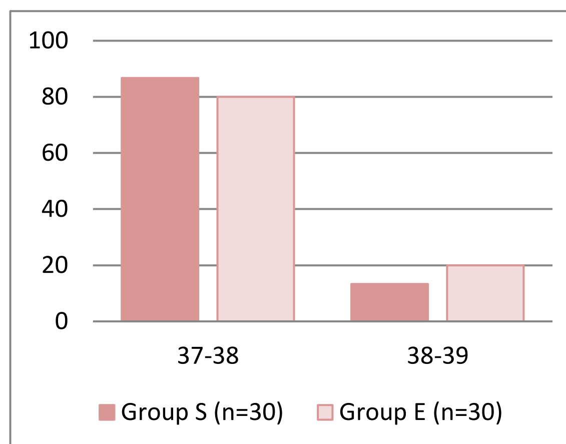

Figure-1: Gestational weeks of the patients (n=60)

Spinal anaesthesia has a shorter onset time. Onset of anaesthesia referred as time from anaesthesia to surgical incision. Present study shows that, in the S group was shorter than in the E group ($p<0.05$). The result was significant (p value = 0.0021). The total anaesthesia time in the E group was significantly longer than in the S group (8.6±2.8 minutes versus 11.2±4.1 minutes, respectively).

Table-4: Time to onset of anaesthesia (n=60)

Time (min)	Number of patients		p value
	Group S (n=30)	Group E (n=30)	
6-10	23	16	0.0021
11-15	7	14	
Mean ± SD	8.6 ± 2.8	11.2± 4.1	

The pin-prick test was used to assess the times to reach S2, L4, T12 and T9 sensory blocks and the times to reach motor block. The rate of block progression of the spinal anaesthesia was higher than other group (group E); at the same time the level of block was higher and the duration of block was longer. At the time of 10th min after injection, in case of Group-S highest level of sensory block was T9, all the patients 30 (100%) achieved sensory block. But in case of Group E at that same time highest sensory level blockade found T11 in 19 (63.3%) to T2 11 (36.7%) of patients.

Table-5: Level of sensory block (n=60)

Duration	Frequency and level of sensory block									
	Group S (n=30)					Group E (n=30)				
	S_2	L_4	T_{12}	T_{11}	T_9	S_2	L_4	T_{12}	T_{11}	T_9
5 min	13	17	-		-	16	14	-	-	-
7 min	-	-	7	23	-	-	3	16	11	-
10 min	-	-	-	7	23	-	-	11	19	-
> 10 min	-	-	-	-	30	-	-	7	9	14

Regarding the heart rate, no significant difference was detected between the groups. Compared with group S patients, group-E patients show slight but statistically non-significant increased heart rate at the 10 min time (80, 92 beats/min respectively). Following that heart rate decreased between S group and E group @ 82 and 80 beat/min at 15th min, 80 and 78 beat/min at 20th min, 76 and 70 beat/min at 30th min, 78 and 67 beat/min at 45th min respectively. So, at the end of follow up we found that, heart rate almost stabilized in both spinal & epidural groups.

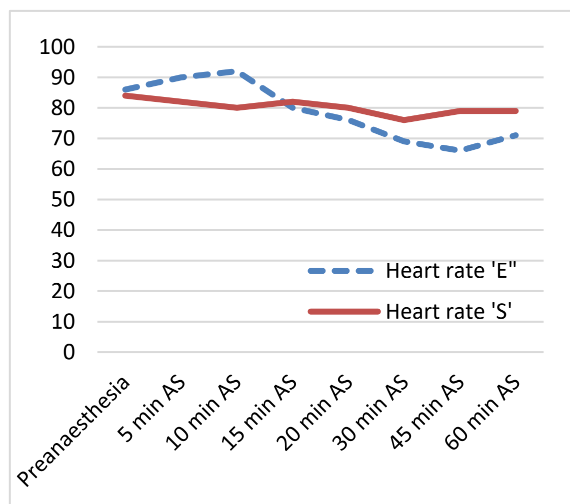

Figure-2: Trends of heart rate (HR) in the studied group (n=60); (AS = after anaesthesia)

In this study hypotension episodes were more frequent in the spinal anaesthesia group at 5, 10 & 15th minute time. After anaesthesia significant decrease in MAP was seen in both groups compared with basal MAP, the least decrease occurring in the group E and the highest fall in the group S. At the 5th minute MAP was 67.90±9.5 and 73.45±8.2 mm of Hg in group S & group E respectively showing significant difference (p=0.0001). After 30-minute, mean blood pressure was 75.18±7.5 mmHg in group S and 75.57±10.2 mmHg in group E, which statistically non-significant (p>0.05) between two groups but follow up after 60-minute mean BP stabilized to similar in both group, which was statistically not significant (p>0.05) between two groups.

Table-6: Evaluation of mean arterial pressure (MAP) between groups with respect to time

Time point after Spinal Anaesthesia		Mean arterial – MAP (m	
		Group S (n=30)	(
Preanaesthesia		68.93±9.1	6
5 min AS		67.90±9.5	7
10 min AS		65.25±10.2	7
15 min AS		69.18±9.5	7
20 min AS		74.73±9.1	7
30 min AS		75.18±7.5	7
45 min AS		74.46±11.4	7
60 min AS		78.52±11.1	7

AS= after anaesthesia.

In this study hypotension episodes were more frequent in the spinal anaesthesia group at 5, 10 & 15th minute time. After anaesthesia significant decrease in MAP was seen in both groups compared with basal MAP, the least decrease occurring in the group E and the highest fall in

the group S. At the 5th minute MAP was 67.90±9.5 and 73.45±8.2 mm of Hg in group S & group E respectively showing significant difference (p=0.0001). After 30-minute, mean blood pressure was 75.18±7.5 mmHg in group S and 75.57±10.2 mmHg in group E, which statistically non-significant (p>0.05) between two groups but follow up after 60-minute mean BP stabilized to similar in both group, which was statistically not significant (p>0.05) between two groups.

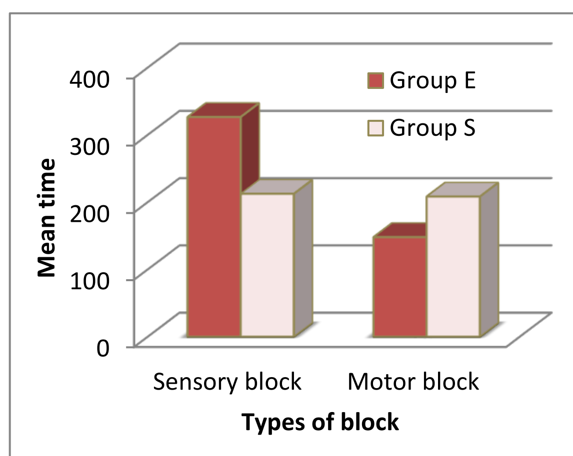

Figure- 3: Mean duration (min) of motor and sensory block

Mean duration (min) of motor and sensory block was non-significant between groups, although sensory and motor block lasted longer in the epidural group as compared to the spinal group. Present study shows that duration of motor block was 130.60 min. and 192.48 min in group E and Group S respectively. Sensory block was 326.60 min. and 212.48 min in group E and Group S respectively.

Table-7: Assessment of Bromage score (n=60)

Grade	Number of patients		P-value
	Group E (n=30)	Group S (n=30)	
I	0	0	0.165
II	0	0	
III	18 (60%)	23 (76.6%)	
IV	12 (40%)	7 (23.3%)	

An average Bromage score of 4 was achieved for the motor block in both groups (p = 0.165)

Table-8: Occurrence of complication

Complications	Frequency of occurrence	
	Group S (n=30)	Group E (n=30)
Nausea	7	2
Vomiting	3	0
Hypotension	12	3

None of the patients in the group-E experienced vomiting, only two patients noticed nausea. In the spinal group (Group-S), seven patients had nausea and three of them experienced episodes of vomiting. Three patients in the E group and 12 patients in the S group had hypotension (p = 0.03).

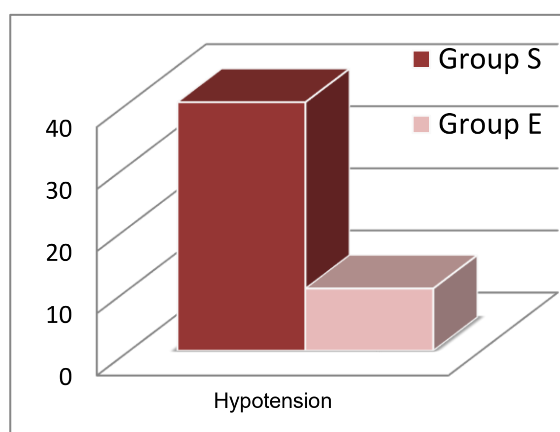

Figure- 4: Frequency of hypotension

Three patients (10.0%) in the E group and 12 (40.0%) patients in the S group had hypotension (p = 0.03).

DISCUSSION

Total of 60 patients fulfilling inclusion/exclusion criteria were studied to determine the relative efficacy and side-effects of spinal versus epidural anaesthesia in women undergone caesarean section. While studying the distribution of cases by age it was found that majority of the patients i.e. 81.6% (n=49) were between 18-24 years, mean age was found to 23.8±10.2 years. No significant differences were found between groups with respect to age. All patients were with ASA physical status I or II. Group S, 19 (63.3%) were ASA I and 11 (36.6%) were ASA II. Group E, 18 (60%) were ASA I and 12 (40%)

were ASA II. Similar study reported that demographic characteristics of age, body height, weight, nullipara or multipara, and cervical at the time of EA were compared; there was no statistical difference between group [6]. Another study shows that mean age was found to 28.6±5.8 years. No significant differences were found between groups with respect to demographic characteristics [7]. Spinal and epidural anaesthesia are more commonly used. The use of spinal anaesthesia for Caesarean delivery was facilitated by the popularization of pencil-point needles, which dramatically reduced the incidence of post-dural puncture headache [8]. Present study demonstrated that spinal anaesthesia has a shorter onset time. Onset of anaesthesia referred as time from anaesthesia to surgical incision. In the S group was shorter than in the E group ($p<0.05$). The result was significant (p value = 0.0021). The total anaesthesia time in the E group was significantly longer than in the S group (8.6±2.8 minutes versus 11.2±4.1 minutes, respectively). Regarding the heart rate, no significant difference was detected between the groups. Compared with group S patients, group E patients show slight but statistically non-significant increased heart rate at the 10 min time (80, 92 beat/min respectively). So, at the end of follow up we found that, heart rate almost stabilized in both spinal & epidural groups. Findings are accordance with result of other study. In a study time from anaesthesia to surgical incision in the SA group was shorter than in the EA group ($p<0.001$). The “Onset of Anaesthesia” time in the EA group was significantly longer than in the SA group (90.72±17.48 minutes versus 84.72±16.04 minutes, respectively). Hypotension episodes were more frequent in the SA group (38.7% vs. 11.1%, $p<0.001$) [9]. Another study among ninety-seven women shows, there was a small (<30%) but significant ($P<0.01$) fall in blood pressure in both groups of women. Six women in the epidural group required supplemental analgesics during the operation compared to only 1 patient in the spinal group ($P<0.01$). Muscle relaxation was judged to be inadequate in 3 patients in the spinal group and in 5 patients in the epidural group. One patient in the spinal group had a characteristic post-spinal headache lasting 3 days. The injection-delivery time was shorter ($P<0.01$) in the spinal group compared to the epidural group. The results suggest that spinal anaesthesia is a good alternative to epidural anaesthesia for elective caesarean section [10]. In this study, pin-prick test was used to assess the times to reach S2, L4, T12 and T9 sensory blocks and the times to reach motor block. The rate of block progression of the spinal anaesthesia was higher than other groups (group E); at the same time the level of block was higher and the duration of block was longer. Although either isobaric or hyperbaric preparations of local anesthetic can be placed intrathecally for a spinal anesthetic, hyperbaric solutions containing 8% dextrose are typically used to facilitate anatomic and gravitational control of the block distribution. The medication will flow along the spinal curvature to a position providing a T4 anesthetic level that is not significantly affected by a patient's height [11]. The duration of a single shot spinal is variable (and depends on the agents used), but normally provides adequate surgical anaesthesia for >90 min. Bupivacaine is frequently used for Caesarean delivery spinal anaesthesia with typical doses between 10 and 15 mg. In this study hypotension episodes were more frequent in the spinal anaesthesia group at 5th, 10th & 15th minute time. After anaesthesia, significant decrease in MAP was seen in both groups compared with basal MAP, the least decrease occurring in the group E and the highest fall in the group S. At the 5^{th}minute MAP was 67.90±9.5 and 73.45±8.2 mm of Hg in group S & group E respectively showing significant difference ($p=0.0001$). After 30-minute, mean blood pressure was 75.18±7.5 mmHg in group S and 75.57±10.2 mmHg in group E, which was statistically non-significant ($p>0.05$) between two groups. Follow up after 60-minute mean BP stabilized to similar in both group, which was statistically not significant ($p>0.05$) between two groups. Previous study reported that women receiving spinal anaesthesia for caesarean section showed reduced time from start of the anaesthetic to start of the operation, but increased need for treatment of hypotension [3]. Maternal hypotension frequently occurs with supine positioning, because the gravid uterus can compress the aorta and vena cava, decreasing cardiac preload and output. In addition, significant supine hypotension occurs in up to 15% of pregnant women (defined as a decrease in mean arterial pressure (MAP) >15 mmHg with increase in heart rate (HR) >20 bpm) [12]. Both neuraxial and general anesthetic techniques decrease sympathetic tone and may further exacerbate the degree of hypotension from the aortocaval compression. The constellation of diaphoresis, nausea, vomiting and changes in cerebration frequently accompany supine hypotension [13]. Placement of a spinal anesthetic is technically easier than an epidural blockade. It is more rapid in onset and more reliable in providing surgical anaesthesia from the mid-thoracic level to the sacrum with a failure rate of <1% [14]. The risk of profound hypotension is higher with spinal anaesthesia than with epidural anaesthesia, because the onset of the sympathectomy is more rapid and dosing is not titrated. Maternal hypotension and fetal outcome are improved with avoidance of aortocaval compression (left uterine displacement), trendelenburg positioning, hydration and appropriate use of vasopressors. A rapid onset local

anesthetic (e.g. 3% 2-chloroprocaine) given through a newly placed epidural catheter will take ∼10 min for an appropriate surgical block [15]. However, extension of a preexisting T10 level of analgesia to a T4 level of surgical anaesthesia can reliably be accomplished in <5 min with alkalinized 3% 2-chloroprocaine or alkalinized 1.5 or 2% lidocaine [16]. The addition of preservative-free morphine may be given in the epidural catheter for postoperative pain control. In this study mean duration (min) of motor and sensory block was non-significant between groups. Although sensory and motor block lasted longer in the epidural group as compared to the spinal group, present study shows that duration of motor block was 192.48 min and 130.60 min. in Group S and Group E and respectively. Sensory block was 212.48 min and 326.60 min. in Group S and Group E respectively. In the spinal group (Group-S), seven patients had nausea and three of them experienced episodes of vomiting. None of the patients in the group-E experienced vomiting, only two patients noticed nausea. Twelve patients in the S group and three patients in the E group had hypotension (p=0.03). In a meta-analysis, no difference was found between spinal and epidural techniques with regards to failure rate, need for additional intraoperative analgesia, need for conversion to general anaesthesia intraoperatively, maternal satisfaction, need for postoperative pain relief and neonatal intervention. Women receiving spinal anaesthesia for caesarean section showed reduced time from start of the anaesthetic to start of the operation, but increased need for treatment of hypotension [3]. Providing a safe effective anesthetic technique for Caesarean delivery requires a detailed understanding of the physiologic changes associated with pregnancy, labor and delivery. These changes are a result of alterations in the maternal hormone balance, biochemical shifts related to larger metabolic demands of the fetus and placenta, and mechanical forces from the gravid uterus. Although each organ system is affected by pregnancy, the changes to the cardiovascular, respiratory and gastrointestinal systems have specific pertinent anesthetic implications around Caesarean delivery [17].

Conclusions

Effective regional anaesthesia for caesarean section can be achieved by both spinal and epidural techniques. Regional anaesthesia (spinal or epidural anaesthesia) for caesarean section is the preferred option when balancing risks and benefits to the mother and her fetus. Spinal anaesthesia for caesarean section is thought to be advantageous due to simplicity of technique, rapid administration and onset of anaesthesia. anaesthesia. Compared to epidural, spinal anaesthesia allows surgery to begin earlier, but increases the need to treat hypotension. There was no difference shown with respect to haemodynamic status, need for additional intraoperative analgesia, conversion to general anaesthesia intraoperatively and neonatal intervention. Differences in side-effects such as post dural puncture headache, nausea and vomiting, and postoperative complications needing anaesthetic intervention were inconclusive due to the small numbers reported.

Limitations of the Study

Small sample size of the study population.

It was a single centre study. Only patients admitted in Shaheed Ziaur Rahman Medical College Hospital, Bogura were taken for the study. So, this will not reflect the overall picture of the country. A large-scale study needs to be conducted to reach to a definitive conclusion

Sample were taken by purposive method in which question of personal biasness might arise.

Others limitations were short duration of study and limited investigation facility.

Family income, which can be an important determinant in pregnancy outcomes, could not be clarified under socio-demographic characteristics, as income could not be verified.

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