ORIGINAL ARTICLE

Frequency of Complications of Spinal Anaesthesia for Caesarean Delivery

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ABSTRACT

Background: The choice of anesthesia for C-section depends upon indication for operation, patient and obstetrician preference and choice of anesthesiologist. Recent trends in obstetric anesthesia are to give preference to regional anesthesia. Spinal anesthesia allows the mother to be awake, minimize the problem of maternal aspiration and avoid neonatal depression associated with general anesthesia.
Aim: To determine the frequency of complication of spinal anaesthesia at Sir Ganga Ram Hospital in patients undergoing elective caesarean section.
Study Design: Descriptive cases series.
Study Setting: Department of Obstetrics and Gynaecology Sir Ganga Ram Hospital Lahore.
Study duration: From 21-10-2008 to 20-04-2009.
Sample size: Total 370 cases undergoing caesarean section under spinal anaesthesia were included through non probability/ purposive sampling technique.
Results: Mean age of patients was observed 28.09±4.10. Hypotension was present in 89 patients (24%). Headache developed at 12 hours in 2 patients (0.5%), at 24 hours, in 6 patients (0.6%), at 48 hours, in 12 patients (3.3%). Hemoglobin level showed, majority of the patients 315(85.2%) had Hb between 9-10 gm/dl, 35 patients (9.4%) had Hb 11 while 20 patients (5.4%) had Hb more than 11gm/dl.
Conclusion: Spinal anaesthesia using 25G spinal needle and applying suitable technique was not associated with increased risk of post-spinal headache.
Keywords: Spinal anesthesia, caesarean section, Hypotension, Headache.

INTRODUCTION

Caesarean section is when baby is born through an incision in the mother's abdomen and uterine wall. This requires effective anaesthesia which can be regional (epidural or spinal) or a general anaesthesia. Spinal anaesthesia has evolved as the preferred anesthetic technique for most cases of caesarean section. Regional anaesthesia mainly spinal is used for around 95% of planned caesarean deliveries in the United States[1]. Advantages for the mother include remaining awake for the birth, avoiding risks for the general anaesthesia and facilitating effective postoperative pain relief. Spinal anaesthesia is easy to administer, cost effective and has rapid onset of action. Complications related with spinal anaesthesia for caesarean delivery are maternal hypotension, spinal shock, failed or difficult spinal and Post Dura puncture headaches[2,3,4].

Maternal hypotension is the most common complication after caesarean section under spinal anaesthesia. Hypotension which is 20% decrease in systolic blood pressure from the baseline occurs in 72% of the patients. Most frequent preventive measures to decrease its incidence and severity include uterine shift to the left, preload and vasopressors. Controlled blood pressure was defined as mean of three successive blood pressure values taken prior to surgery[5].

Post Dura puncture headaches characteristically occur in the first 3 days after the spinal anaesthetic, and is thought to result from CSF leaking through the hole of the dura puncture site[6]. It is usually, but not exclusively, felt in the fronto-occipital region and becomes worse when the patient is upright. The reported incidence with 25 gauge needle is about 4% but it is more likely when larger gauge needle has been used[7].

This study will help to establish practice guide lines in our department and will also help patients as it is less expensive, has fewer complications and easy management of complications when they do occur.

The objective of the study was to determine the frequency of complications of spinal anesthesia at Sir Ganga Ram hospital in patients undergoing elective caesarean section.

PATIENT AND METHODS

A descriptive cases series was carried out at the department of Obstetrics and Gynaecology in collaboration with Department of Anaesthesia, Sir Ganga Ram hospital from 21-10-2008 to 23-04-2009. Through a non-probability, purposive sampling

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calculated sample size with 2% margin of error, 95% confidence level taking expected percentage of post-dura puncture headache i.e., 4% was 370 cases undergoing elective caesarean section under spinal anaesthesia between 20-35 years of age, not more than 5 gravida with hemoglobin more than or equal to 9gms/dl were included in our study. Patients with fetal distress on CTG or me conium stained liquor on clinical examination, or with shock with systolic blood pressure of 80 mmHg and below.

Patients with known disseminated intra vascular coagulation on history and on anticoagulant therapy on history or previously diagnosed cardiac disease in pregnancy were excluded from the study. After Informed consent was taken for spinal anaesthesia, a 25 gauge spinal needle was introduced into the subarachnoid space of the level of L_{3-4} 2ml of hyperbaric bupivacaine solution was injected into the space. For presence or absence of hypotension, regular pulse and blood pressure monitoring was done every 15 minutes for 1 hour, then every 30 minutes for next 6 hours. Patients were followed for the presence or absence of headache after 12 hours, 24 hours, 48 hours and after 72 hours. Blood pressure readings and assessment of presence of absence of headache was assessed by the researcher herself. Data was analyzed using SPSS 10.0 Descriptive statistical analysis was done for qualitative and quantitative variables. Qualitative variables were presence of absence of hypotension and headache and frequency / percentage were calculated. On the other hand, mean and standard deviation was calculated for quantitative variables (age). Data was stratified for age and Hb levels (9-10gm/dl, 11gm/dl and above to address effect modifiers.

RESULTS

Among 370 patients were between the age of 26 to 30 yeas. Among 370 patients, 95 patients were between 20 and 25 years of age. 180 patients were between 26 and 30 years. 95 patients were between 31 to 35 years of age with mean age of 28.09±4.10. Parity distribution showed, 135 patients (36.4%) were gravida 1-2. Gravida 3-4 were 140(37%) while 95 patients (25.7%) were gravida 5. Hypotension was present in 89 patients (24.0%). Headache developed in 23 patients among the total of 370. Headache developed at 12 hours in 2 patients (0.5%), 24 hour sin 6 patients (0.6%), of 48 hours in 12 patients (3.3%) and at 72 hours in 3 patients (0.8%). Haemoglobin level, majority of the patients 315 (85.2%) had Hb between 9-10 gm/dl, 35 patients (9.4%) had Hb 11gm/dl while 20 patients (5.4%) had Hb more than 11gm/dl (Tables 1).

Table 1: Demographic and clinical characteristics (n=370)

Variable	Frequency	Percentage
Age (Year) Mean±SD 28.09+4.10		
20-25	95	25.7
26-30	180	48.6
31-35	95	25.7
Gravidity		
1-2	135	36.4
3-4	140	37.9
5	95	25.7
Hypotension		
Present	89	24.0
Absent	281	76.0
Headache		
Present	02	0.5
Headache		
Present	06	1.6
Absent	364	98.4
Headache		
Present	12	3.3
Absent	358	96.7
Haemoglobin		
9-10	315	85.2
11	35	09.4
>11	20	05.4

DISCUSSION

Headache after dural puncture is a complication of spinal anaesthesia and is believed to result from leakage of CSF both at the time of dural puncture and probably more importantly continuing leak of CSF afterwards into the surrounding soft tissues[8].

Leaking CSF leads to chronic lowering of the cerebrospinal spinal fluid pressure. This exerts downward traction on the structure of central nervous system and on blood vessels that are attached to the discs and cranium as well as the brain stem. This lead to the headache similar to the acute vascular cluster headache[8].

Post-spinal puncture headache usually appears twelve hours after the lumbar puncture and worsen in upright position. Other characteristics are throbbing frontal quality association with nausea and vomiting and prompt relief upon resumption of supine position. Post-spinal headache occurs typically 8-12 hours post-operatively because this is the time when patient first sits or stands up[9].

The incidence of post-spinal headache is high in obstetric patients which is due to increase in intra-abdominal pressure which tends to increase in cerebrospinal pressure and in return leakage from the dural rent is high. Reported frequency of post-spinal headache ranges from 4% to 40% with 25G needle.

In present study, 5.2% patients developed post-spinal headache with 25 G needle. This shows that incidence of post-spinal headache can be reduced by small gage needle and by using appropriate technique.

In this study we treated post-spinal headache conservatively. Patients were given aggressive hydration, soft diet to avoid constipation and they were advised to lie down instead of sitting or standing up.

Similarly no cased of any nerve injury was seen nor a single case of total spinal anaesthesia or profound hypotension recorded. In a similar study conducted by conducted by Malik et al[8] at CMH, Kharian, the reported incidence of post-spinal headache was 5% with 25 gauge needle.

In another study conducted by sheikh et al[10] at Ayub Medical College Abbottabad, the frequency of PDPH was 8.3% with 25 G needle. In a study done by Brown ridge[11] the incidence of headache was 8.6%.

The incidence of post-spinal hypotension in obstetric patient is high because vascular tone is more dependent upon sympathetic control in pregnant than in non pregnant state. So hypotension develops more readily and more markedly consequent to sympathetic blockage following spinal anaesthesia. Aortocaval compression in pregnant women in the supine position in another contributory factor. Cautious and adequate preloading of the patient using ringer lactate solution or normal saline solution through a wide bore needle and right hip wedge to displace the uterus to the left lateral side immediately after the injection of spinal drug is advised to prevent a severe drop in blood pressure[12].

A total of 370 patients were included in present study. Among them, 89 patients (24%) developed hypotension and they needed increased fluid therapy and vasopressors.

This study in similar to another study conducted by Sharma[13] at Nepal on 200 patients. He observed the frequency of hypotension in 78 cases (38%) even with the use of crystalloid solution. Sule et al found the incidence of hypotension in 3% of cases[12].

To summaries, studies have revealed that the incidence of post-spinal hypotension during caesarean section is very high unless prophylactic measures are taken. It is as much as >80% but with prophylactic measures as low as zero percent. Use of fluid preloading helps improving sympathetic block as well as utero-placental circulation. Similarly use of vasopressure especially ephedrine helps preventing nausea, vomiting and hypotension.

CONCLUSION

The incidence of post-spinal hypotension during caesarean section is very high unless prophylactic measures are taken. The use of fluid pre-loading, vasopressures like ephedrine, left uterine displacement and legs raising all have been seen to be effective in preventing post-spinal hypotension and with a good maternal and fetal outcome. Hypotension is not deleterious to mother and fetus if it is corrected within a short period of time of 2 minutes. Spinal anaesthesia using 25G spinal needle and applying suitable technique was not associated with increased risk of post-spinal headache.

REFERENCES

1. Cyna AM, Andrew M, Emmett RS, Millteon P, Simmons SW, Kuczkowski KM. Techniques for preventing hypotension during spinal anaesthesia for caesarean section. Coch Data Syst Rev 2006.
2. Nafiu OO, Elegbe EO. Post-dural puncture headache in obstetric patients- Experience from a West African teaching hospital. Int J Obstet Anaesthesia 1999; 8: 205-6.
3. Gogarten W. Spinal anaesthesia for obstetrics. Best Pract Res Clin Anaesthesiol 2003; 17: 377-92.
4. Hossain N, Tayab S, Mahmood T. Spinal anaesthesia for caesarean section. J Surg Pak 2002; 7: 19-21.
5. Jenkins JG, Khan MM. Anaesthesia for caesarean section: a survey in UK region from 1992 to 2002. Anaesthesia 2003; 58: 1114-8.
6. Afolabi BB, Kaka AA, Abudu OO. Spinal and general anaesthesia for emergency caesarean section: effects on neonatal Apgar score and maternal haematocrit Niger Postgrad Med J 2003; 10: 51-5.
7. Imarengiaye CO, Otoide VO, Ande AB, Obiaya MO. Anaesthesia related complications following caesarean delivery necessitating intensive care unit admissions in a tertiary centre. Afr J Med Sci 2001; 30: 220 – 32.
8. Malik TM, Khan MA, Iqbal A. Post-spinal headache: comparing needles of 25 and 27 gauges of incidence of post-spinal headache. Professional Med J 2007; 14: 441-7.
9. Ghafari MH, Movafegh A, Zadeh NS. A comparison of incidence of the postdural puncture headache and low back pain in the cesarean section patients undergoing spinal anesthesia and general anesthesia: a randomized clinical trial study. Res J Biolog Sci 2009; 4: 187-9.
10. Sheikh JM, Memon A, Memon JA, Khan M. Post-dural puncture headache after spinal anaesthesia for caesarean section: a comparison of 25G quincke, 27G Quincke and 27G Whitacre spinal needles. J Ayub Med Coll Abbottabad 2008; 20: 10-3.
11. Brown ridge P. Spinal anaesthesia revisited: an evaluation of subarachnoid block in obstetrics. Anaesth Intensive Care 1984; 12: 334-42.
12. Sule AZ, Isamade ES, Ekwempu CC. Spinal anaesthesia in lower abdominal and limb surgery: a review of 200 cases. Nigerian Jurg Res 2005; 7: 226-30.
13. Sharma NR. Incidence of postspinral hypotension during cesarean section. J Institute Med 2005; 27: 31-3.