

# Complications of Spinal Anaesthesia in Caesarean Section

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## ABSTRACT

**Objective:** The aim of this study was to evaluate the frequency of maternal complications during spinal anaesthesia.

**Design:** A descriptive case study.

**Place & duration of study:** The study was conducted at Gynae Unit I, Allama Iqbal Medical College/ Jinnah Hospital, Lahore from March 2009 till December 2009.

**Material & methods:** The study comprised of 300 consecutive patients who underwent caesarean section under spinal anaesthesia alone. The patients requiring general anaesthesia in addition to spinal anaesthesia, and those with coagulopathy, severe anaemia and spinal deformities were excluded. Patients were followed at an interval of 12 and 72 hours to see any complication, which were documented.

**Results:** Majority of the patients i.e. 60.67% (n=182) were between 25-30 years, 22.33% (n=67) were between 20-25 years. Regarding mode of admission 78.33% (n=235) booked while 21.67% (n=65) were un-booked cases. Parity distribution revealed 40.44% (n=121) patients multigravida and 59.67% (n=179) primigravida. Intraoperatively, 35.66% (n=107) suffered from with hypotension, 32% (n=96) were found affected with nausea/vomiting (intra operatively), 10%(n=30) were found with headache and among them 30%(n=9) were found within 12 hours while remaining 70%(n=21) were found in 72 hours. However, 22.33% (n=67) had no complications of spinal anaesthesia

**Conclusion:** Spinal anaesthesia is a safe method of conducting anaesthesia during pregnancy with out any long term complications.

**Key words:** Cesarean Section, spinal anaesthesia, complications.

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## INTRODUCTION

All over the world, regional anesthesia is commonly used for cesarean section. The choice of anesthesia is determined by the clinical condition of patient, available facilities and expertise of Anesthetist. The role of anesthesiologist is to ensure the comfort and safety<sup>1</sup>. Spinal anaesthesia allows the mother to be awake. It facilitates effective postoperative pain relief<sup>2,3</sup>. It offers many benefits to the mother and the baby over general anaesthesia. Majority of women welcome the chance to be aware during the birth of their baby. If regional anaesthesia is performed with great care and attention to maternal physiology, then it is probably fundamentally safer than general anaesthesia for caesarean section<sup>4</sup>. The hazards of difficult airway associated with weight gain and edema can be avoided, along with the problems of regurgitation because of physiological weakening of gastro-esophageal sphincter and an increase in gastric in volume and acid production<sup>5</sup>. A successful regional anaesthesia effectively suppresses many of the pain mediated stress responses to surgery such as rise in blood pressure, heart rate and increase in

plasma concentrations of catecholamines, cortisol and glucose. The net advantage is that placental perfusion is maintained. It is cost effective, as lesser number of drugs are required, making it relatively inexpensive. Spinal block is also associated with lesser amount of surgical haemorrhage<sup>6</sup>.

The major adverse effect of spinal anesthesia for mother is hypotension<sup>7,8</sup>. Maternal hypotension leads to uteroplacental hypoperfusion and can provoke an acute fall in intervillous blood flow with the potential for fetal acidemia<sup>9,10</sup>. Furthermore, cardiac arrest may occur. To improve our management and patient care, this study was conducted to determine the frequency of spinal anaesthesia related complications in patients undergoing caesarean section.

## MATERIALS AND METHODS

The study was conducted in the Department of Gynaecology, Allama Iqbal Medical College/ Jinnah Hospital, Lahore from March 2009 till December 2009. This was a descriptive study. 300 cases were included with 95% confidence level, 5% margin of error and taking expected percentage of headache i.e. 25% (least among all in- patients undergoing spinal anaesthesia for cesarean section). The

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patients with age 20 to 40 years, who underwent cesarean section in spinal anaesthesia alone, were included in the study. Patients, who also had general anaesthesia in addition to spinal anaesthesia due to prolonged surgery, coagulopathy (assessed by platelet count, PT, APTT), severe hypovolemia, spinal deformity, neurological impairment, severe anemia (Hb% <7) and presence of headache pre-operatively were not offered spinal anaesthesia.

For spinal anaesthesia, a 25 gauge spinal needle was introduced into the subarachnoid space at the level of L<sub>3-4</sub>. 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 2 minutes till delivery of baby and then at five minutes interval up to thirty minutes. Patients were followed for the presence or absence of headache after 12 hours, and 72 hours postoperatively. Vomiting was observed intra-operatively. The data was analyzed using SPSS version 12.0. Descriptive statistic analysis was done for outcome variables. Qualitative variables were presence or absence (Yes/No) of hypotension, nausea/vomiting and headache. Frequency and percentages of these variables were calculated. Mean and standard deviation of qualitative variables (age) was calculated.

**RESULTS**

A total of 300 patients fulfilling inclusion/exclusion criteria were studied to determine the frequency of complications of spinal anaesthesia in cesarean section. While studying the distribution of cases by age it was found that majority of the patients i.e. 60.67% (n=182) were between 20-25 years, 22.33% (n=67) were between 25-30 years, 11.67% (n=35) between 31-35 years and only 5.33% (n=16) were found between 36-40 years of age, mean age was found to 26.41±2.76 (Table-1).

Table 1: Age distribution (n=300)

Age (in Years)	=n	%age
20-25	67	22.33
25-30	182	60.67
31-35	35	11.67
36-40	16	5.33
Mean and S.D.	26.41±2.76	

Regarding mode of admission 78.33% (n=235) were found booked while 21.67% (n=65) were un-booked cases (Table 2).

Table 2: Distribution of cases by mode of admission (n=300)

Mode of admission	n=	%age
Booked	235	78.33
Un-booked	65	21.67

Parity distribution revealed that 40.44% (n=121) patients were multigravida while 59.67% (n=179) were found primigravida (Table 3).

Table 3: Distribution of cases by parity (n=300)

Parity	n=	%age
Multigravida	121	40.33
Primigravida	179	59.67

Table 4 shows the immediate complications of spinal anaesthesia; in this table 35.66%(n=107) were found with hypotension, 32% (n=96) were found affected with nausea/vomiting (intra operatively), 10%(n=30) were found with headache and among them 30%(n=9) were found within 12 hours while remaining 70%(n=21) were found in 72 hours, however, 22.33%(n=67) had no complications of spinal anaesthesia.

Table 4: Complications of spinal anaesthesia (n=300)

Complications (at 30 minutes after delivery)	=n	%age
Hypotension	107	35.66
Nausea/vomiting (intra-operative)	96	32
Head ache 12 hrs up till	09	03
Head ache 71 hrs	21	07
No complications	67	22.33

**DISCUSSION**

Spinal anaesthesia is induced by injecting small amounts of local anaesthetic into the cerebro-spinal fluid (CSF). Spinal anaesthesia is easy to perform and has the potential to provide excellent operating conditions for caesarean section<sup>11</sup>. If the anaesthetist has an adequate knowledge of the relevant anatomy, physiology and pharmacology; safe and satisfactory anaesthesia can easily be obtained, to the mutual satisfaction of the patient, surgeon and anaesthetist<sup>12</sup>.

Spinal anaesthesia has distinctive advantages over general anaesthesia<sup>1</sup>. Anaesthetic drugs and gases are costly and the latter often are difficult to transport. The costs associated with spinal anaesthesia are minimal. Spinal anaesthesia produces few adverse effects on the respiratory system as long as unduly high blocks are avoided<sup>3</sup>. As control of the airway is not compromised, there is a reduced risk of airway obstruction or the aspiration of gastric contents. This advantage may be lost if too much sedation is given. Spinal anaesthesia provides excellent muscle relaxation for lower abdominal and lower limb surgery<sup>11</sup>. Blood loss during operation is less than when the same operation is done under general anaesthesia. This is because of a fall in blood pressure and heart rate and improved venous

drainage with a resultant decrease in oozing. The bowel is contracted during spinal anaesthesia and sphincters are relaxed although peristalsis continues. Normal gut function rapidly returns following surgery<sup>12</sup>. Post-operative deep vein thromboses and pulmonary emboli are less common following spinal anaesthesia<sup>13</sup>.

Apart from multiple benefits, few disadvantages of spinal anaesthesia do exist. Sometimes it can be difficult to find the dural space and occasionally, it may be impossible to obtain CSF and the technique has to be abandoned<sup>14</sup>. Despite an apparently faultless technique, anaesthesia is not obtained, in few rare cases<sup>15</sup>. Hypotension may occur with higher blocks and the anaesthetist must know how to manage this situation, with the necessary resuscitation drugs and equipment immediately available<sup>7</sup>. As with general anaesthesia, continuous, close monitoring of the patient is mandatory. Some patients are not psychologically suitable to be awake, even if sedated, during an operation. They should be identified during the preoperative assessment. Likewise, some surgeons find it very stressful to operate on conscious patients. Even if a long-acting local anaesthetic is used, a spinal anaesthesia is not suitable for surgery lasting longer than approximately 2 hours<sup>14</sup>. Patients find lying on an operating table for long periods uncomfortable. If an operation unexpectedly lasts longer than this, it may be necessary to convert to a general anaesthetic or supplement the anaesthesia with intravenous ketamine or with a propofol infusion<sup>16</sup>. There is a theoretical risk of introducing infection into the sub-arachnoid space and causing meningitis. This should never happen if equipment is sterilized properly and an aseptic technique is used. A postural headache may occur postoperatively<sup>17</sup>. This should be rare.

In the current study, we analyzed the immediate maternal complications during cesarean section due to spinal anaesthesia. The commonest complication was hypotension which was observed in 107 patients (35.66%). A study conducted by Somboonviboon W et al<sup>18</sup> at Department of Anesthesiology, University Bangkok, Thailand, includes 722 parturient undergoing cesarean section under spinal anaesthesia, the incidence of hypotension and bradycardia were 52.6% and 2.5% respectively. The above study also shows the high incidence of hypotension, which is comparable to our study.

Regarding nausea and vomiting it was experienced that 32% (n=96) were found faced these complications. Our findings are in accordance with the study conducted by Cappelleri G et al<sup>19</sup> in which they compared general anaesthesia and spinal anaesthesia in cesarean section revealing the fact that

the nausea and vomiting are more frequently observed in spinal anaesthesia.

In our study 10 patients (30%) complained of spinal headache in the post-operative period. The results of the study conducted by L'ubuský M et al<sup>20</sup> regarding post-dural puncture headache during spinal anaesthesia for cesarean section reveal 9 patients (16.67%) out of 54. The results of their study are not in accordance with this study, but another study found 11% of patients with postdural puncture headache in 11% and among them 90% headache occur within 3 days of the procedure and 66% started within first 48 hours. In our study, 70% (n=21) out of 30 were found to have headache within first 48 hours. This headache may be resolved within 6 weeks. This complication also should not be taken lightly as it has a potential for considerable morbidity. Most of the cases get rid of this complication spontaneously while in some cases, it may be continued for several months or even for a year as well<sup>21</sup>.

Luckily, we never experienced spinal shock, cardiac arrest and sub dural hematoma in any case. No procedure related infection, immediate - within six hours of the spinal anaesthetic manifesting as meningism or meningitis or late, at the site of injection, in the form of pus discharge, due to improper sterilization of the LP set was observed.

## CONCLUSION

Spinal anaesthesia conveys significant advantages due to the simplicity of its use and rapid onset of action. Spinal anaesthesia does not have any long term risk of life threatening morbidities or mortalities.

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