

## ORIGINAL RESEARCH

# Assessment of anaesthesia-related risk factors in elective caesarean section

<sup>1</sup>Dr. Deepti, <sup>2</sup>Dr. Arshi Dutt<sup>1</sup>Chanana Consultant Cardiac Anaesthesia NHM, J.N. Medical College, AMU Aligarh<sup>2</sup>Consultant Gynaecologist Shaheed Hasan Khan Mewati Medical College Neh Nalhar Haryana**Corresponding Author**

Dr. Deepti

Chanana Consultant Cardiac Anaesthesia NHM, J.N. Medical College, AMU Aligarh

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**ABSTRACT**

**Background:** The Caesarean section (CS) is currently one of the most often carried out major surgeries on women worldwide. The present study was conducted to assess anaesthesia-related risk factors in elective caesarean section.

**Materials & Methods:** 76 full-term pregnant females were selected, Height, weight, BMI, gravidity, previous abortions, previous abortions etc. was recorded.

**Results:** Hypotension was absent in 46, mild in 15, moderate in 10 and severe in 5. The mean weight was 75.4 Kgs, 73.6 Kgs, 74.8 kgs and 72.4 Kgs respectively. The mean height was 156.4 cms, 157.2 cms, 158.3 cms and 158.1 cms in patients with no, mild, moderate and severe hypotension respectively. BMI was 18.5- 20 Kgs/m<sup>2</sup> seen in 26, 8, 6 and 2, 25-30 Kgs/m<sup>2</sup> in 12, 5 and 3 and 2 and >30 Kgs/m<sup>2</sup> in 8, 2, 1 and 1 patient respectively. Gravidity was 1 seen in 23, 4 and 3, gravidity 2 seen in 17, 6, 5 and 2 and gravidity >2 was seen in 6, 5, 2 and 1 in patient respectively. The difference was significant (P< 0.05). History of previous abortion was seen in 15, 6, 3 and 2, previous CS was seen in 11, 7, 4 and 3, history of stillbirth was seen in 7, 3, 2 and 1 in mild, moderate and severe hypotension patients respectively. The difference was significant (P< 0.05).

**Conclusion:** Authors found that height, weight, BMI, gravidity, prior abortions, and prior abortions were the significant risk variables for SA-induced hypotension.

**Key words:** Caesarean section, hypotension, Gravidity

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**INTRODUCTION**

The Caesarean section (CS) is currently one of the most often carried out major surgeries on women worldwide.<sup>1</sup> Despite the fact that both regional and general anesthesia (GA) are suitable for caesarean deliveries, use of GA has significantly declined over the past few decades due to a higher risk of anaesthesia-related maternal mortality. Spinal anaesthesia (SA) is now the preferred method for CS as a result. SA has a number of adverse effects, the most prevalent of which is maternal hypotension, which could be dangerous for both mother and child despite the fact that it is normally well tolerated.<sup>2</sup> SA frequently causes hypotension, which can be problematic for both mother and baby. Hypotension is defined as a decline in arterial blood pressure of greater than 20% from the baseline.<sup>3</sup> Pregnancy-related risk factors for hypotension include a history of high blood pressure, body mass index (BMI), the amount of time between spinal induction and delivery of the fetus, the urgency of the surgery, spinal additives, the length of the crystalloid load, and the rate of injection.<sup>4</sup> Long-term maternal hypotension

can affect the fetus because there is no autoregulation of the placental vascular bed, which results in poorer fetal Apgar scores, fetal acidosis, and hypoxia.<sup>5</sup> According to the literature, assessing the risk variables linked to SA-induced hypotension may help prevent catastrophic outcomes for both the mother and the newborn by identifying individuals who are most at risk early.<sup>6</sup> The present study was conducted to assess anaesthesia-related risk factors in elective caesarean section.

**MATERIALS & METHODS**

The present study comprised of 76 full-term pregnant females of ASA physical status grade I or II scheduled for elective caesarean section under spinal anaesthesia. A written consent was obtained from all patients to participate in the study. Data such as name, age, etc. was recorded. Spinal anaesthesia was performed in sitting position using 2 ml bupivacaine 0.5% with or without opioid into the subarachnoid space. Parameters such as systolic blood pressure (SBP), diastolic blood pressure (DBP) and heart rate (HR) were recorded every 2 min until delivery.

Height, weight, BMI, gravidity, previous abortions, obtained were subjected to statistical analysis. P value previous abortions etc. was recorded. Data thus < 0.05 was considered significant.

## RESULTS

**Table I: Assessment of maternal variables**

| Parameters               | Variables | Hypotension |           |               |            | P value |
|--------------------------|-----------|-------------|-----------|---------------|------------|---------|
|                          |           | No (46)     | Mild (15) | Moderate (10) | Severe (5) |         |
| Weight (Kgs)             |           | 75.4        | 73.6      | 74.8          | 72.4       | 0.84    |
| Height (cm)              |           | 156.4       | 157.2     | 158.3         | 158.1      | 0.91    |
| BMI (Kg/m <sup>2</sup> ) | 18.5-25   | 26          | 8         | 6             | 2          | 0.05    |
|                          | 25-30     | 12          | 5         | 3             | 2          |         |
|                          | >30       | 8           | 2         | 1             | 1          |         |
| Gravidity                | 1         | 23          | 4         | 3             | 2          | 0.04    |
|                          | 2         | 17          | 6         | 5             | 2          |         |
|                          | >2        | 6           | 5         | 2             | 1          |         |

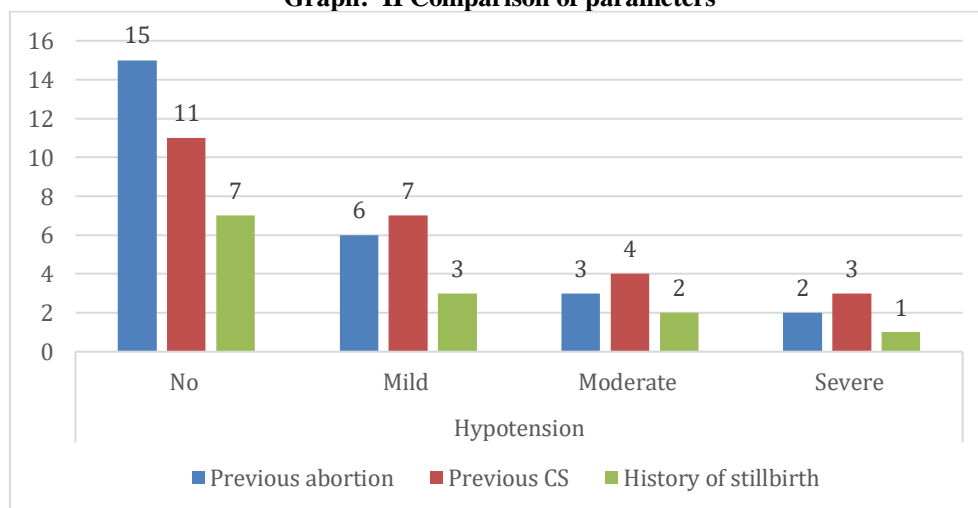
Table I shows that hypotension was absent in 46, mild in 15, moderate in 10 and severe in 5. The mean weight was 75.4 Kgs, 73.6 Kg s, 74.8 kg s and 72.4 Kg s respectively. The mean height was 156.4 cms, 157.2 cms, 158.3 cms and 158.1 cm s in patients with no, mild, moderate and severe hypotension respectively. BMI was 18.5- 20 Kgs/m<sup>2</sup> seen in 26, 8, 6 and 2, 25-30 Kg s/m<sup>2</sup> in 12, 5 and 3 and 2 and >30 Kgs/m<sup>2</sup> in 8, 2, 1 and 1 patient respectively. Gravidity was 1 seen in 23, 4 and 3, gravidity 2 seen in 17, 6, 5 and 2 and gravidity >2 was seen in 6, 5, 2 and 1 in patient respectively. The difference was significant (P< 0.05).

**Table II Comparison of parameters**

| Parameters            | Hypotension |      |          |        | P value |
|-----------------------|-------------|------|----------|--------|---------|
|                       | No          | Mild | Moderate | Severe |         |
| Previous abortion     | 15          | 6    | 3        | 2      | 0.01    |
| Previous CS           | 11          | 7    | 4        | 3      | 0.05    |
| History of stillbirth | 7           | 3    | 2        | 1      | 0.02    |

Table II, graph II shows that history of previous abortion was seen in 15, 6, 3 and 2, previous CS was seen in 11, 7, 4 and 3, history of stillbirth was seen in 7, 3, 2 and 1 in mild, moderate and severe hypotension patients respectively. The difference was significant (P< 0.05).

**Graph: II Comparison of parameters**



## DISCUSSION

Maternal hypotension is the most common complication of spinal anaesthesia during caesarean section and is associated with reduced utero-placental perfusion.<sup>7,8</sup> Although this hypotension can be catastrophic and poses a threat to both mother and neonate, it is not always severe and is readily

treatable. If short-lived (not more than two minutes), it does not significantly affect neonatal outcome.<sup>9,10</sup> With the gradual introduction of regional anaesthesia since 1998, currently over 90% of the Caesarean deliveries are done under spinal anaesthesia. This change in trend towards spinal anaesthesia has led to significant lowering of the morbidity and mortality

associated with the anaesthesia during Caesarean delivery.<sup>11,12</sup> The present study was conducted to assess anaesthesia-related risk factors in elective caesarean section. We observed that hypotension was absent in 46, mild in 15, moderate in 10 and severe in 5. The mean weight was 75.4 Kgs, 73.6 Kgs, 74.8 kgs and 72.4 Kgs respectively. The mean height was 156.4 cms, 157.2 cms, 158.3 cms and 158.1 cms in patients with no, mild, moderate and severe hypotension respectively. BMI was 18.5- 20 Kgs/m<sup>2</sup> seen in 26, 8, 6 and 2, 25-30 Kgs/m<sup>2</sup> in 12, 5 and 3 and 2 and >30 Kg s/m<sup>2</sup> in 8, 2, 1 and 1 patient respectively. Gravidity was 1 seen in 23, 4 and 3, gravidity 2 seen in 17, 6, 5 and 2 and gravidity >2 was seen in 6, 5, 2 and 1 in patient respectively. Olang et al<sup>13</sup> assessed the incidence of neonatal acidaemia following delivery through caesarean section under spinal anaesthesia and determine the prevalence of maternal hypotension. Forty- three babies (27.2%) were born with neonatal acidaemia, defined as umbilical arterial blood pH ≤ 7.2. There was, however, no significant difference in the five minutes Apgar scores between the acidotic and non-acidotic neonates. Twenty- eight patients (17.7%) developed maternal hypotension. The hypotension was readily corrected within two minutes (mean of 1.43 minutes) of onset using vasopressors and boluses of intravenous fluids. We observed that history of previous abortion was seen in 15, 6, 3 and 2, previous CS was seen in 11, 7, 4 and 3, history of stillbirth was seen in 7, 3, 2 and 1 in mild, moderate and severe hypotension patients respectively. 99 women at full-term scheduled for elective caesarean sections were part of Wang et al's<sup>14</sup> study. They were randomly divided into 3 equal groups: the LL group, where the patient was initially positioned in the full left-lateral position before being moved to the left-tilt supine position with the needle bevel oriented laterally; the LS group, where the patient was initially positioned in the full left-lateral position before being moved to the left-tilt supine position; and the CS group, where the patient was initially positioned in the full left-lateral position before being moved to the Incidences of hypotension were 9.7%, 54.8%, and 56.3% in the LL, LS, and CS groups, respectively. Fakherpour et al<sup>15</sup> in their study selected 511 mothers who underwent elective CS under SA. The incidence of mild, moderate and severe hypotension was 20%, 35% and 40%, respectively. 10 risk factors were found to be associated with hypotension such as age >35 years, body mass index ≥25 kg/m<sup>2</sup>, 11–20 kg weight gain, gravidity ≥4, history of hypotension, baseline systolic blood pressure (SBP) 100 beats/min in maternal modelling, fluid preloading ≥1000 ml, adding sufentanil to bupivacaine and sensory block height >T4 in anaesthesia-related modelling.

## CONCLUSION

Authors found that height, weight, BMI, gravidity, prior abortions, and prior abortions were the significant risk variables for SA-induced hypotension.

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