

## Original Research

### Determination of maternal and anaesthesia-related risk factors and incidence of spinal anaesthesia-induced hypotension in elective caesarean section- A clinical study

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#### ABSTRACT:

**Background:** Spinal anesthesia is preferred by both mothers and surgeons due to its multiple advantages. The present study determined maternal and anaesthesia-related risk factors and incidence of spinal anaesthesia-induced hypotension in elective caesarean section. **Materials & Methods:** 100 full-term pregnant females scheduled to undergo elective CS under SA were assessed for systolic blood pressure (SBP), diastolic blood pressure (DBP), BMI (kg/m<sup>2</sup>), gravidity, height, weight, previous abortions and previous abortions etc. **Results:** Hypotension was not present in 35, mild in 40, moderate in 20 and severe in 5. The mean weight was 74.2 Kgs, 79.4 Kgs, 79.8 kgs and 79.0 Kgs, mean height was 160.2cms, 163.4cms, 162.1cms and 162.0cms in patients with mild, moderate and severe hypotension respectively. BMI was 18.5- 20 Kgs/m<sup>2</sup> seen in 18, 20, 3 and 1, 25-30 Kgs/m<sup>2</sup> in 10, 8 and 4 and 2 and >30 Kgs/m<sup>2</sup> in 7, 12, 3 and 2 patients without, mild, moderate and severe hypotension respectively. Gravidity was 1 seen in 20, 4 and 3, 2 seen in 12, 4 and 1 and >2 in 8, 2 and 1 in patients with mild, moderate and severe hypotension respectively. The difference was significant (P< 0.05). History of stillbirth was seen among 10, 4 and 5, history of previous abortion in 12, 7 and 7, previous CS was seen in 15, 8 and 9, history of hypotension in 16, 12 and 11 in mild, moderate and severe hypotension patients respectively. The difference was significant (P< 0.05). **Conclusion:** Authors found that main risk factors for SA-induced hypotension was height, weight, BMI, gravidity, previous abortions and previous abortions.

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

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#### INTRODUCTION

Spinal anesthesia is preferred by both mothers and surgeons due to its multiple advantages.<sup>1</sup> Spinal anesthesia is a type of regional anesthesia that has been practiced for obstetric anesthesia since 20th century. Nowadays regional anesthesia has become the most preferred method for caesarean section owing to its simplicity and fastest onset along with maternal comfort and safety.<sup>2</sup> Hypotension with the use of SA is not uncommon which may pose difficulty in baby and mother.<sup>3</sup> The fall in arterial blood pressure more than 20% from baseline is regarded as hypotension.<sup>4</sup> The probable risk factors of hypotension among pregnant women are history of hypertension,

body mass index (BMI), time interval between spinal induction and fetal delivery, urgency of surgery, spinal additives, duration of crystalloid load and speed of injection.<sup>5</sup>

As there is no autoregulation for the placental vascular bed, prolonged maternal hypotension can be harmful to the foetus, induce lower foetal Apgar scores, foetal acidosis and hypoxia.<sup>6</sup> Literature suggests that assessment of the associated risk factors with SA-induced hypotension may inhibit and identify early patients most at risk, to evade dangerous outcome in mother and neonate.<sup>7</sup> The present study was conducted to assess maternal and anaesthesia-related risk factors and incidence of spinal

anaesthesia-induced hypotension in elective caesarean section.

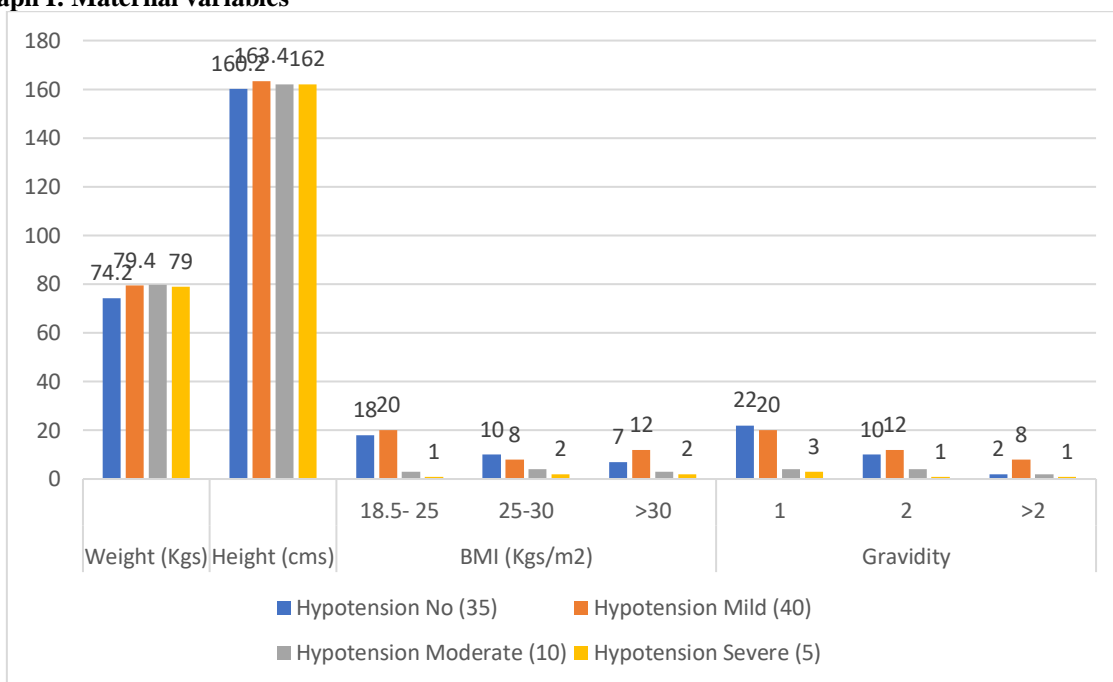
**MATERIALS & METHODS**

The present study consisted of 100 full-term pregnant females with American Society of Anaesthesiologists’ (ASA) physical status grade I or II scheduled for elective caesarean section under spinal anaesthesia. All patients gave their written consent for participation in the study. Data such as name, age, etc. was recorded. Spinal anaesthesia was performed in sitting position by

injection of a local anaesthetic (2 ml bupivacaine 0.5% with or without opioid) into the subarachnoid space. Assessment of systolic blood pressure (SBP), diastolic blood pressure (DBP) and heart rate (HR) were recorded every 2 min until delivery and every 5 minutes. Parameters such as BMI (kg/m<sup>2</sup>), gravidity, height, weight, previous abortions, previous abortions etc. was recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

**RESULTS**

**Graph I: Maternal variables**



Graph I shows that hypotension was not present in 35, mild in 40, moderate in 20 and severe in 5. The mean weight was 74.2 Kgs, 79.4 Kgs, 79.8 kgs and 79.0 Kgs, mean height was 160.2cms, 163.4cms, 162.1cms and 162.0cms in patients with mild, moderate and severe hypotension respectively. BMI was 18.5- 20 Kgs/m<sup>2</sup> seen in 18, 20, 3 and 1, 25-30 Kgs/m<sup>2</sup> in 10, 8

and 4 and 2 and >30 Kgs/m<sup>2</sup> in 7, 12, 3 and 2 patients without, mild, moderate and severe hypotension respectively. Gravidity was 1 seen in 20, 4 and 3, 2 seen in 12, 4 and 1 and >2 in 8, 2 and 1 in patients with mild, moderate and severe hypotension respectively. The difference was significant (P< 0.05).

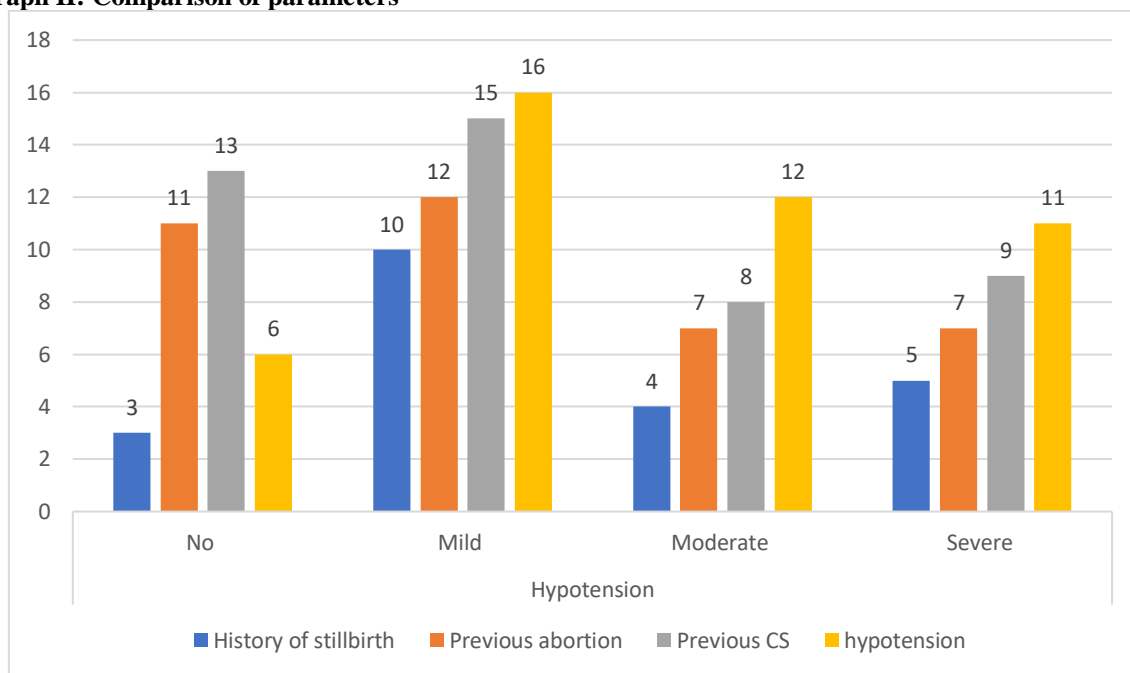
**Table II: Comparison of parameters**

Parameters	Hypotension				P value
	No	Mild	Moderate	Severe	
History of stillbirth	3	10	4	5	0.05
Previous abortion	11	12	7	7	0.04
Previous CS	13	15	8	9	0.02
hypotension	6	16	12	11	0.05

Table II, graph II shows that history of stillbirth was seen among 10, 4 and 5, history of previous abortion in 12, 7 and 7, previous CS was seen in 15, 8 and 9,

history of hypotension in 16, 12 and 11 in mild, moderate and severe hypotension patients respectively. The difference was significant (P< 0.05).

**Graph II: Comparison of parameters**



**DISCUSSION**

Among females, caesarean section(CS) is commonly employed obstetric surgery performed universally.<sup>8,9</sup> There has been decline in application of general anaesthesia (GA) for caesarean section in last couple of years because of occurrence of anesthesia induced mother deaths.<sup>10,11</sup>Owing to this, the use of spinal anaesthesia (SA) in caesarean delivery has increased drastically. It has been observed that SA is not free from side effects though its tolerance is quite high.<sup>12,13</sup>The present study was conducted to assessmaternal and anaesthesia-related risk factors and incidence of spinal anaesthesia-induced hypotension in elective caesarean section.

We observed that hypotension was not present in 35, mild in 40, moderate in 20 and severe in 5. The mean weight was 74.2 Kgs, 79.4 Kgs, 79.8 kgs and 79.0 Kgs, mean height was 160.2cms, 163.4cms, 162.1cms and 162.0cms in patients with mild, moderate and severe hypotension respectively. BMI was 18.5- 20 Kgs/m<sup>2</sup> seen in 18, 20, 3 and 1, 25-30 Kgs/m<sup>2</sup> in 10, 8 and 4 and 2 and >30 Kgs/m<sup>2</sup> in 7, 12, 3 and 2 patients without, mild, moderate and severe hypotension respectively. Gravidity was 1 seen in 20, 4 and 3, 2 seen in 12, 4 and 1 and >2 in 8, 2 and 1 in patients with mild, moderate and severe hypotension respectively. Fakherpour et al<sup>14</sup> in their study enrolled 511 mothers mother 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.

We observed that history of stillbirth was seen among 10, 4 and 5, history of previous abortion in 12, 7 and 7, previous CS was seen in 15, 8 and 9, history of hypotension in 16, 12 and 11 in mild, moderate and severe hypotension patients respectively. Wang et al<sup>15</sup>comprised of 99 women at full-term gestation scheduled for elective caesarean section. They were randomized into 3 equal groups: the LL group, in which the patient was placed in the full left-lateral position until the start of surgery with the Whitacre needle bevel oriented laterally; the LS group, in which the patient was placed in the full left-lateral position initially and then shifted to the left-tilt supine position with the needle bevel oriented laterally; and the CS group, in which the patient was initially placed in the full left-lateral position and then shifted to the left-tilt supine position with the needle oriented in the cephalad direction.The incidences of hypotension in the LL, LS, and CS groups were 9.7%, 54.8%, and 56.3%, respectively. Ephedrine requirements were lower in the LL group than in the LS group (P<0.01).

**CONCLUSION**

Authors found that main risk factors forSA-induced hypotensionwas height, weight, BMI, gravidity, previous abortions and previous abortions.

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