Original Article

Comparison of Outcome of Sitting versus Lateral Position Undergoing Spinal Anesthesia for Cesarean Section

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Abstract

Objective: To compare the outcomes of sitting versus lateral position in patients undergoing spinal anaesthesia for caesarean section in terms of frequencies of hemodynamic stability and patients' comfort.

Methodology: This randomized controlled trial study was conducted at the Department of anaesthesia and critical care, mother and child health center, PIMS, Islamabad from February 21, 2017 to August 20, 2017. Patient's position was made according to allocated group and baseline parameters were noted before the procedure, with the patient's blood pressure and heart rate recorded as time'0'. Under aseptic measures, spinal anaesthesia was performed with a 25G quincke shaped spinal needle. A total dose of 3ml (0.5%) hyperbaric bupivacaine was given in the subarachnoid space over 20 seconds at the level of L3-L4. The patient was helped to turn back to the supine position immediately after the spinal anaesthesia procedure.

Results: A total of 130 patients were included according to the inclusion criteria. Mean age in both the groups was 28.02±14.51 and 27.74+5.14 whereas mean body mass index in both the groups was 18.37±0.30 and 17.70+2:59 respectively. There were 18 (27.7%) and 24 (36.9%) patients in both the groups who have hypotension, which was statistically not significant (p-value 0.260) and 03 (4.6%) patients presented with bradycardia which was statistically not significant (p-value 0.310). In the study, there were 10 (15.4%) and 20 (30.8%) caesarean patients in both the groups who felt very comfortable undergoing spinal anaesthesia which was statistically significant (p-value 0.004).

Conclusion: The study concludes that both sitting and lateral positions have similar effects in terms of level of comfort and hemodynamic stability. However, patients generally found lateral position very comfortable.

Key words: Spinal Anaesthesia, Cesarean section, Lateral position.

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Introduction

Spinal anaesthesia is typically the preferred technique for caesarean sections, while general anaesthesia is associated with a greater rate of maternal morbidity and mortality.[1] In recent years, there has been a surge in the number of pregnant patients having caesarean sections, and depending on the patient's health, spinal anaesthesia seems to be more advantageous in these cases.[2] Spinal anaesthesia prevents the drawbacks of general anaesthesia, including airway manipulations, pharmacological intervention, postoperative respiratory issues, and cognitive loss. Because once vaginal delivery puts the mother or the baby in risk, a caesarean section is advised. Not all of these situations require a caesarean section, and in many instances, the obstetrician must exercise their professional judgement.[3]

Subarachnoid blocks in expectant mothers are frequently performed in sitting and lateral positions.[4] The spread of local anaesthetic and the onset and intensity of block are both affected by the positioning of

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the mother. Faster block onset is linked to hemodynamic alterations that are harmful to pregnant women.[4] Pregnant women are more likely to experience hypotension after spinal anaesthesia, which is due in part to the cephalad distribution of topical analgesics in the subarachnoid space and in part to the pressure the pregnant woman's uterus places on the aortocaval.[5-7] Due to their weight and the lack of obvious landmarks, pregnant women can receive spinal anaesthetic more easily in the sitting position, although some patients find it very challenging to maintain the sitting position.[5]

Spinal anaesthesia resulted in a sympatheticectomy, in addition to worsening the accumulation of the peripheral blood caused by the gravity, causes significant hypotension during the sitting condition.[5,8,9] Both the mother and the foetus are affected by hypotension, which can cause dizziness, nausea and vomiting in the mother and acidemia in the foetus.[5,10] It has been observed that during intrathecal injection in a caesarean section, satisfactory sensory and motor blockade was effectively accomplished in both the sitting and lateral postures without a significant difference in the hemodynamic changes or motor blockade.[3] While sitting is more comfortable for the expectant mother, while lateral position has a superiority of faster sensory blockage onset.[3] Another study concluded that except for the fact that patients feel very comfortable in a lateral posture, while the position for spinal anaesthesia had no effect on haemodynamic stability or block characteristics in either group.[2] On the other hand, it was recently observed that the sitting position was determined to be preferable to the lateral position for doing subarachnoid block for caesarean delivery due to better hemodynamic stability, the need for fewer attempts, and higher maternal comfort, even if T5 block took longer to complete.[4] By taking the controversial observations regarding the position of the mother, which can affect the local anesthetic's transmission, which in turn can affect how rapidly sensory block develops and has an impact on hemodynamics.[11]

This study has been done to determine the comparative outcomes of sitting versus lateral position in patients undergoing spinal anaesthesia for caesarean section in terms of frequencies of hemodynamic stability and patients' comfort.

Methodology

This randomized controlled trial was done at the department of anaesthesia and critical care, mother and child health center, PIMS, Islamabad, from February 21, 2017 to August 20, 2017. All normal healthy patients with a BMI of less than 30, nonsmokers, good exercise tolerance, or mild systemic disease were included. All the patients with comorbidities like hypertension during pregnancy, gestational diabetes, patients with placenta previa, patients with history of the cardiac abnormalities, patients presenting for emergency caesarean section, patients with history of injuries and deformity affecting the spinal cord or vertebral column were excluded. Informed consent was taken and patient was allotted to a study group as either group S or group L by a lottery method on arrival to the operation theatre (with two 18G iv lines in situ). By starting with standard monitoring (ECG, NIBP, SpO2) the patient was preloaded with 20ml/kg of ringer lactate.

Patient's position was made according to the allocated group and baseline parameters were noted before the procedure, with the patient's blood pressure and heart rate recorded as time'0'. Under aseptic measures, spinal anaesthesia was performed with a 25G Quincke shaped spinal needle. A total dose of 3ml (0.5%) hyperbaric bupivacaine was given in the subarachnoid space over 20 seconds at the level of L3-L4. The patient was helped to turn back to the supine position immediately after the spinal anaesthesia procedure.

Results

The mean age was 28.02±14.51 years in sitting group and 27.74±5.14 years was in lateral position group. Mean gestational age was 38.27 ±1.11 in sitting group and 38.30±1.13 weeks in lateral position group. The average BMI in the sitting group was 18.370.30 kg/m2 and 17.702.59 kg/m2 in the lateral position group. Table I)

Table I: Descriptive statistics of demographic characteristics (n=130)

Variables	Study group	N	Statistics	
			Mean	SD
Age (year)	Sitting	65	28.02	4.51
	Lateral position	65	27.74	5.14
Gestational age (weeks)	Sitting	65	38.27	1.11
	Lateral position	65	37.30	1.13
Body mass index (BMI) (kg/m^2)	Sitting	65	18.37	0.30
	Lateral position	65	17.70	2.59

There were 62 (95.4) and 63 (96.9) patients in both the groups who have ASA grade-I whereas 03 (4.6) and 02 (3.1) patients in both the groups have ASA grade-II. Hypotension was lower 18 (27.7%) in the cases of sitting group versus 24 (36.9%) of the cases in lateral position group, while findings statistically insignificant (p-0.260). Bradycardia was in 2(3.1%) cases of sitting group and in 3(4.6%) cases of the lateral position group (p-0.648). While comfort level was significantly higher in sitting group (53 (81.5%) versus 36 (55.4%), and uncomforted level was more in lateral position group (2 (3.1%) versus 9 (13.8%)) (p-0.004). (Table II)

Level of the comfort was statistically significant according to age group of 18 -30 years, gestational age normal BMI (p-<0.05), while level of the comfort was statistically insignificant according to age group of 31-40 years and BMI > 25 kg/m2 (p->0.05), results shown in table III.

Discussion

There are various reasons to use general anaesthetic, including unsuccessful regional anaesthesia, circumstances where it is not advised, maternal request, and life-threatening foetal compromise when there may not be enough time to use a regional method.[3] Although spinal or epidural anaesthesia can be used to do this, spinal anaesthesia is a straight forward procedure with a low rate of failure, rapid onset, and minimal medication dose.[3] In this study mean age was 28.02±14.51 years in sitting group and 27.74±5.14 years was in lateral position group. Mean gestational age was 38.27 ±1.11 in sitting group and 38.30±1.13 weeks in lateral position group. The average BMI in the sitting group was 18.370.30 kg/m2 and 17.702.59 kg/m2 in the lateral position group. Consistently, Kharge ND et al[2] reported that the average age of the sitting position group's group was 23.50 years, while it was 23.43 years for those in lateral position patient's group. In the sitting position group, the mean height was 156 CM, compared to 155 CM in the lateral position group. In the lateral position group, the mean weight was 62.25kg, while in the sitting position group, it was 63.25kg, although they did not calculate the BMI of the patients. On other hand Simin A et al[12] reported that the average age of the lateral group was 28.68±5.85 years and 30.84±5.52 years was of sitting group. In the study of Manouchehrian N et al[5] reported that the women under spinal anaesthesia in the sitting and lateral positions had mean ages of 30.28

Table II: Comparison of level of comfort, hypotension and bradycardia in both groups.

Outcome		Study group		p-value
		Sitting position	Lateral position	
Level of comfort	Very comfort	10 (15.4%)	20 (30.8%)	0.004
	Comfort	53 (81.5%)	36 (55.4%)	
	Uncomfortable	2 (3.1%)	9 (13.8%)	
Hypotension	Yes	18 (27.7%)	24 (36.9%)	0.260
	No	47 (72.3%)	41 (63.1%)	
Bradycardia	Yes	2(3.1%)	3(4.6%)	0.648
	No	63(96.9%)	62(95.4%)	

Table III: Stratification of effect modifiers with hypotension in both the groups.

Effect modifiers		Two group	Hypotension		p-value
			Yes	No	
Age group	18-30 years	Sitting	09 (36.0%)	36 (52.2%)	0.165
		Lateral	16 (64.0%)	33 (47.8%)	
	31-40 years	Sitting	09 (52.9%)	11 (57.9%)	1.000
		Lateral	08 (47.1%)	08 (42.1%)	
Gestational age (weeks)	37-40 weeks	Sitting	17 (42.5%)	45 (53.6%)	0.249
		Lateral	23 (57.5%)	39 (46.4%)	
	41-42 weeks	Sitting	01 (50.0%)	02 (50.0%)	1.000
		Lateral	01 (50.0%)	02 (50.0%)	
ASA grades	Grade I	Sitting	17 (41.5%)	45 (53.6%)	0.204
		Lateral	24 (58.5%)	39 (46.4%)	
	Grade II	Sitting	01 (100.0%)	02 (50.0%)	1.000
		Lateral	0 (0)	02 (50.0%)	
Body Mass index (BMI)	Normal (<24 .9)	Sitting	17 (41.5%)	45 (53.6%)	0.204
		Lateral	24 (58.5%)	39 (46.4%)	
	Over weight (≥ 25.0)	Sitting	01 (100.0%)	02 (50.0%)	0.361
		Lateral	0 (0)	02 (50.0%)	

6.86 years and 31.00 5.013 years respectively.

In this study hypotension was lower 18 (27.7%) in the cases of sitting group versus 24 (36.9%) of the cases in lateral position group, while findings statistically insignificant (p-0.260). Bradycardia was in 2(3.1%) cases of sitting group and in 3(4.6%) cases of the lateral position group (p-0.648). In the study of Hussain R et al[13] reported that the study of the participants' heart rates at various intervals in both groups revealed that the average heart rates were marginally higher in the sitting group (81.132.49) than in the lateral group (79.932.02), but the discrepancy was not statistically significant (P>0.05). On other hand Pinsornsak B et al[14] reported that when compared to the S group, the L group had a significantly higher rate of hypotension (40 percent vs. 22.5 percent, p=0.04). Consistently Shahzad K et al[15] demonstrated that the heart rate, systolic blood pressure, and diastolic blood pressure did not significantly change. Anaesthesia began more quickly in the sitting group (4.5 minutes vs 5.4 minutes). Coppejans HC et al[16] also reported that it was technically simpler and caused less severe hypotension to administer a mixed spinal-epidural anaesthetic approach for caesarean birth while seated.

In this study comfort level was significantly higher in sitting group 53 (81.5%) versus 36 (55.4%), and uncomforted level was more in lateral position group 2 (3.1%) versus 9 (13.8%) (p-0.004). Although Manouchehrian N et al[5] reported that there was a statistically insignificant difference between the groups in terms of heart rate, the quality of the sensory and motor block, the maximum height of the sensory block, mean atropine and ephedrine doses, frequency of vomiting and nausea, and satisfaction with spinal anesthesia, the lateral position was significantly higher than that in the sitting position.[5] In the study of Shamlool MM et al[3] reported that during intrathecal injection in a caesarean section, satisfactory sensory and motor blockade was effectively obtained in both the sitting and lateral postures without noticeably different hemodynamic alterations or motor blockade.

The occurrence of hypotension was statistically insignificant according to age, gestational age, ASA grades and BMI, p-values were quite insignificant (p->0.05). Currently, the most used caesarean delivery technique is spinal anaesthesia.[5,17,18] The most frequent side effect of spinal anaesthesia, with a 30–60% incidence rate, is hypotension.[5] Pregnant women are more likely to experience hypotension after spinal anaesthesia, which is attributed in part to the cephalad diffusion of topical analgesics in subarachnoid space and in part to the pressure the pregnant woman's uterus places on the aortocaval.[5]

Conclusion

The study concludes that both sitting and lateral positions have similar effects in terms of level of comfort and hemodynamic stability. However, patients generally found lateral position very comfortable.

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