DOI: https://doi.org/10.53350/pjmhs20221612778

ORIGINAL ARTICLE

Frequency of Post Spinal Hypotension in Elective Cesarean Section after Spinal Anesthesia

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ABSTRACT

Objective: The aim purpose of this research was to raise awareness about the prevalence of hypotension and to increase anaesthetists' vigilance about possible measures to reduce the risk factors of hypotension after spinal anaesthesia in emergency patients undergoing caesarean section at the Hayatabad Medical Complex Peshawar.

Study design: The cross sectional study was conducted at the Hayatabad Medical Complex Hospital Peshawar.

Place and Duration: A concurrent observational study conducted at Hayatabad Medical Complex Peshawar with permission and approval from the Medical Superintendent. The study was conducted from July 2022 to December 2022.

Method: This prospective study was conducted on 272 patients, in which the patients underwent elective CS under SA. The data collection has been indicated in the patient record, then the following information is filled in the data collection sheet: Gander age, MR number, blood pressure before spinal anesthesia, blood pressure after spinal anesthesia, use of antihypertensive drugs, the patient under spinal anesthesia was according to the standard protocol of HMC Hospital Peshawar, data will be collected from participants willing to participate in the study, then patient data will be collected through direct observation and the interview.

Result: we collect data from 272 patients which were treated from spinal anesthesia for caesarian section 73 participants (26.8%) had post-operative hypotension. Different age weight and different drug doses were used in spinal anesthesia, 18-29 years 16 patients (21.9%) and 30-40 years 57 patients (78.1%) were experienced with hypotension.

Conclusion: Based on patient weight, a total of 272 participants weighing between 49-65 kg 9 patients (12.3%), whereas in 66-80 kg 21 patients (28.8%), and 81-90 kg had 43 patients (58.9%) were suffered from hypotension.

Keywords: Cesarean section, spinal anesthesia, spinal induce hypotension,

INRODUCTION

The most frequent type of surgery performed worldwide is an emergency caesarean section. Many of the patients who were recommended underwent surgery while receiving a subarachnoid block(1-3). Due to its ease of administration and quick start-up, spinal anaesthesia is the favoured method for emergency caesarean sections. It entails utilising a spinal needle to administer local anaesthetics to the subarachnoid space and nearby nerves that supply the uterus and abdomen(4, 5). This subarachnoid block primarily supplies at the level of T6 to T10 and is delivered between the L3 and L4 and L4 and L5 subarachnoid spaces. Furthermore, the most prevalent incidental complication following subarachnoid block was hypotension(6, 7). Hypotension is defined as a drop in blood pressure of more than 20% from the mean arterial blood pressure baseline. The prevalence of hypotension was 64% among women who underwent caesarean section after spinal anaesthesia (8, 9). According to Yirgu et al., the incidence of spinal caused hypotension was (80%) and (83%) during 5-15 and 15-25 minutes, respectively. According to a study conducted at Siriraj Hospital, the incidence of hypotension during spinal anaesthesia for caesarean section was 76% (10). History of hypertension, body mass index, the height of the sensory block, the gap between spinal induction and delivery of the foetus, the urgency of the surgery, spinal additives, the length of the crystalloid load, and the rate of injection were potential risk factors for hypotension (11, 12). According to earlier research, the best positions for patients to be in to avoid aortocaval compression, the use of crystalloid and colloidal liquids to increase available vascular volume, the use of ephedrine to raise heart rate, cardiac output, and peripheral vascular resistance, the use of alpha 1 agonists to increase peripheral vascular resistance, and mechanical compression of the lower limbs to increase blood pressure were all likely treatments for hypotension. The quality of anaesthetic management has increased over time, however there were personal observations on the occurrence of hypotension and no prior study in our setup (13, 14). So, the purpose of this research was to raise awareness about the prevalence of hypotension and to increase anaesthetists' vigilance about possible measures to reduce the risk factors of hypotension after spinal anaesthesia in emergency patients undergoing caesarean section at the Hayatabad Medical Complex Peshawar.

MATERIALS AND METHODS

Study Setting: A concurrent observational study conducted at Hayatabad Medical Complex Peshawar with permission and approval from the Medical Superintendent. Sample size was calculated from the incidence of post spinal hypotension in an elective caesarean section after spinal anesthesia using a WH O computer, and consent was obtained from all participants who consented to participate in the study. Consent was approved by HMC Research and Ethics Committee Hospital Peshawar. The study was conducted from July 2022 to December 2022. A performance was created for each patient. Each patient with the correct history was selected

Sample Size: A sample size of 272 patients has been selected based on the prevalence 23% confidence interval 95% and margin of error 5% this has been calculated using the WHO sample size calculator $n = p(1-p)(Z/e)^2$

Data Collection Procedure: Visit to the caesarean section in the respective operating room we were informed about the purpose of the study and asked to take part in the study. All consenting patients were immediately enrolled in the study. The data collection sheet to collect the necessary information for the questionnaire card has been indicated in the patient record, then the following information is filled in the data collection sheet: Gander age, MR number, blood pressure before spinal anesthesia, blood pressure after spinal anesthesia, use of antihypertensive drugs, the patient under spinal anesthesia was according to the standard protocol of HMC Hospital Peshawar, data will be collected from participants willing to participate in the study, then patient data will be collected through direct observation and the interview.

Ethical Consideration: The study was conducted after approval by the hospital's ethics committee and obtaining the patient's consent following spinal hypotension due to elective cesarean spinal anesthesia. Patient under spinal anesthesia.

Data Analysis: All the information obtained were entered in Microsoft excel 2007, percentages were drawn manually. Figures

and tables were drawn using MS excel and Word.

RESULT

In our study we collect data from 272 patients which were treated from spinal anesthesia for caesarian section 73 participants (26.8%) had post-operative hypotension. Different age weight and different drug doses were used in spinal anesthesia, 18-29 years 16 patients (21.9%) and 30-40 years 57 patients (78.1%) were experienced with hypotension. Based on patient weight, a total of 272 participants weighing between 49-65 kg 9 patients (12.3%), whereas in 66-80 kg 21 patients (28.8%), and 81-90 kg had 43 patients (58.9%) were suffered from hypotension. Depending on the dose and drug used, a total of 272 patients used 7.5% bupivacaine with 2% lignocaine in 22 patients (30.1%), bupivacaine with fentanyl had 35 patients (47.9%) and bupivacaine with tramadol 16 participants (21.9%) had hypotension. In our study of a total of 272 patients, 4 patients already had hypotension, representing 1.5%, due to NBM status and dehydration, whereas 73 patients (26.8%) experienced with hypotension after spinal anesthesia. Using dose of bupivacaine 7.5%, 19 participants (26%) had hypotension using 10 mg, whereas 54 patients (74%) were experienced using 15 mg. participants which have past history of anti- hypertensive drugs 63 patients (86.3%) had hypotension, whereas 10 (13.7%) of participants had no past history of anti-hypertensive drugs.

Table 1: Age Wise Distribution Post Spinal Hypotension

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-29 years	125	46.0	46.0	46.0
	30-40	147	54.0	54.0	100.0
	Total	272	100.0	100.0	

The above table 4.1 show the frequency and distribution age of participants in which 18-29 years 125 (46.0%) participants and 30-40 years 147(54.0%) participants.

Table 2: Weight of Patients Post Spinal Hypotension

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	49-65 kg	62	22.8	22.8	22.8
	66-80 kg	103	37.9	37.9	60.7
	81-90 kg	107	39.3	39.3	100.0
	Total	272	100.0	100.0	

The above table 4.2 shows weights of patients divide into three groupsGroup A 49-65 kg had 62 (22.8%) participants, Group B 66-80 kg 103 (37.9%) participants and Group C 81-90 kg had 107 (39.3%) participants.

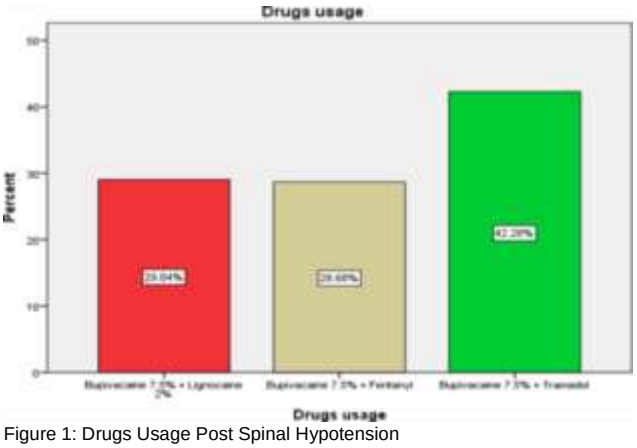

Figure 1: Drugs Usage Post Spinal Hypotension

The above figure 4.1 show drugs usage in which Bupivacaine 7.5% + Lignocaine 2% had use in 79 (29.0%) participants, Bupivacaine 7.5% + Fentanyl 78 (28.7%) and Bupivacaine 7.5% +Tramadol 115 (42.3%) participant had use.

Table 3: Dose of drugs post spinal hypotension

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	10 mg	170	62.5	62.5	62.5
	15 mg	102	37.5	37.5	100.0
	Total	272	100.0	100.0	

The above table 4.3 statistical analysis shows dose of bupivacaine in which 10 mg was use in 170 (62.5%) participants and 15 mg was use in 102 (37.5%) participants.

Table 5: Past history of anti-hypertensive drugs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	122	44.9	44.9	44.9
	No	150	55.1	55.1	100.0
	Total	272	100.0	100.0	

The above table 4.4 shows past history of anti-hypertensive drugsin which 122 (44.9%) participants had use anti-hypertensive drug and 150 (55.1%) of participants had no history.

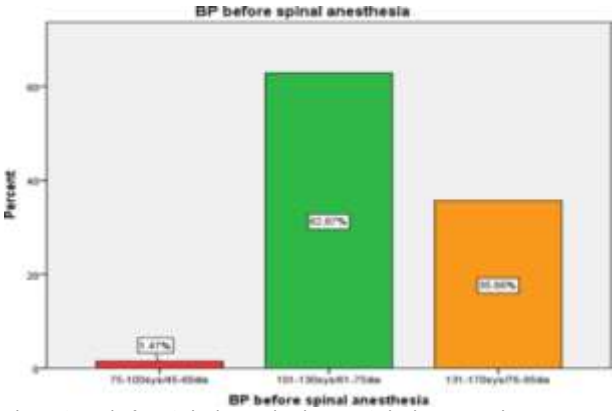

Figure 2: Bp before Spinal Anesthesia Post Spinal Hypotension

The above figure 4.2 statistical analysis show systolic Blood pressure before spinal anesthesia in which 75-100sys/45-60diastolic have 4 (1.5%) patients , 101-130sys/61-75dia have 171 patients (62.9%) and 131-170sys/76-95dia had 97 patients (35.7%)

Table 6: B.P after Spinal Anesthesia Spinal Anesthesia Post Spinal Hypotension

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	75-100sys/45-60dia	73	26.8	26.8	26.8
	101-130sys/61-75dia	111	40.8	40.8	67.6
	131-170sys/76-95dia	88	32.4	32.4	100.0
	Total	272	100.0	100.0	

The above table 4.5 shows the blood pressure after spinal anesthesia in which 75-100sys/45-60diastolic had 73 patients (26.8%), 101-130sys/61-75diastolic had 111 patients (40.8%) and 131-170sys/76-95dia had 88 patients (32.4%).

The above cross figure show those patients who had hypotension after spinal, 73 were experienced with hypotension (26.83%) in 272 participants. In 18-29 years 16 patients (21.9%) and in 30-40 years 57 patients (78.1%) were experienced. In old age the frequency of hypotension was increased in 81-90 kg 43 (58.9%), 66-80 kg 21 patients (28.8%), and in 49-65 kg 9

patients (12.3%) had hypotension.In drug usage Bupivacaine 7.5% + Lignocaine 2% had 22 patients (30.1%), whereas in Bupivacaine 7.5% + Fentanyl 35 participants (47.9%) and Bupivacaine 7.5% +Tramadol 16 patients (21.9%) were suffered from hypotension. Using dose of bupivacaine 7.5%, 19 participants (26%) had hypotension using 10 mg, whereas 54 patients (74%) were experienced using 15 mg. participants which have past history of anti-hypertensive drugs 63 patients (86.3%) had hypotension whereas 10 (13.7%) of participants had no past history of anti-hypertensive drugs.

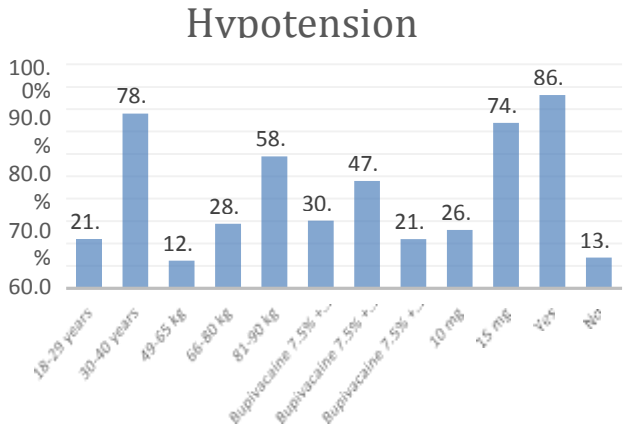

Figure 3: Cross table BP after spinal anesthesia

DISCUSSION

In our study, a total of 272 participants under spinal anesthesia were referred to the gynecology department for an elective caesarean section. Prior to spinal anesthesia, the patient was hypotensive due to non-oral conditions (NBM) and dehydration. In our study with a total of 272 patients, 4 patients were already hypotensive, hypotention. 1.5% but 26.8% of patients are on the verge of hypotension prior to spinal anesthesia (15). Volume preloading in pregnant patients would not affect the onset of hypotension after spinal anesthesia but would not abolish hypotension to some extent, it would only reduce the hypotensive response under spinal anesthesia in this study. Rout et al.' study confirmed a significant reduction in the incidence of postspinal hypotension by leg wrapping compared to leg elevation alone. Leg elevation alone did not show a statistically significant reduction of the incidence of postspinal hypotension with 95% CI, 0.7–4.9(8). However, after analyzing the data, we found that hypotension with spinal block occurs during elective caesarean section, but there are many causes or factors that cause hypotension such as: Among them, baseline SBP < 120 mmHg, history of hypotension (RR = 6.98), and pregnancy ≥ 4 were strong predictors of mild, moderate, and severe hypotension, respectively. Finally, anesthesia-related modeling showed that fluid preload, local anesthetic dose infused with 1 µg safentanil, and sensory blockade were associated with hypotension. Of the anesthesia-related predictors, the level of sensory block ≥ T4 was the strongest predictor (16). Our results confirm previous reports of a high incidence of post-US hypotension during caesarean section. Although changes in physical workload may be a plausible cause, the results of this study identified ten independent variables associated with the occurrence of US- induced hypotension during elective caesarean section (17). Advanced age is repeatedly cited in the current literature as a predictor of AS-induced hypotension. Several studies have shown significant reductions in SBP in older people. Consistent with previous studies, our study had an endpoint of more than 35 years, and the trend towards hypotension in patients with AS starts later. Also, in line with the results of the study conducted by Hasanin et al., the hypotension incidence in the group administrated with a 40-degree LR in the horizontal plane was observed to be much lower than in the control group (34.7% vs. 58.7%, p=0.005) (18). Decreased heart rate and changes in baroreceptor and sympathetic nervous system responses may play important roles in increasing the risk of low blood pressure in elderly patients. The addition of multiple opioids to local anesthetics has now become a popular method for AS in CS to improve intraoperative and postoperative analgesic effects and reduce side effects. The results of this study showed that the combination of sufentanil AC 1 µg and low dose bupivacaine (10 mg) resulted in a lower incidence of moderate to severe hypotension compared to bupivacaine alone. However, most researchers have not found a significant association between intrathecal use of sufentanil and hypotension. The addition of sufentanil to bupivacaine prevented maternal hypotension in nonpregnant women. Therefore, more research is needed to get definitive results.

CONCLUSION

Risk factors for spinal-induced hypotension during caesarean section may include age, BMI, weight gain, pregnancy, history of hypotension, systolic blood pressure and heart rate (risk factors for breast fluid), fluid overload, addition of sufentanil to bupivacaine, and sensory blockade. (Anesthesia). associated risk factors). After analyzing the data, we determined that after spinal anesthesia the spinal induce hypotension is common in elective caesarean sections. Then, to prevent spinal-induced hypotension, we preload the patient with colloids and crystalloidsat 10-15 mg / kg body weight but this method was not satisfactory we also co loading so this combined technique is too much satisfactory to prevent post spinal hypotension. We can administer alpha1 adrenergic agonists such as syneprine and ephedrine which can cause vasoconstriction and increase cardiac input increase pressure.

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