Original Research

Intravenous Norepinephrine And Me Phentermine For Maintenance Of Blood Pressure During Spinal Anaesthesia For Caesarean Section

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ABSTRACT
Background: Due to anesthetic blockage up to the T4 level, 80% of parturients after caesarean section (CS) have been observed to experience spinal anaesthesia induced hypotension (SAIH). The present study compared intravenous norepinephrine and mephentermine for maintenance of blood pressure during spinal anaesthesia for caesarean section.
Materials &Methods:56 parturients selected for elective caesarean section (CS) under subarachnoid block (SAB)were split into two groups of 28 each. For SAIH, group I subjects got intravenous boluses of 8 µg norepinephrine, while group II subjects received 6 mg Mephentermine. In both groups, parameters like Apgar score, systolic and diastolic blood pressure, and side effects were noted and compared.
Results: The mean age in group I subject was 23.5 years and in group II was 25.6 years, height was 160.2 cm in group I and 163.5 cm in group II, weight was 62.7 kgs in group I and 64.8 kgs in group II, duration of surgery was 49.3 minutes in group I and 46.2 minutes in group II, APGAR score at 1st minute was 7.35 in group I and 7.41 in group II and at 5 minutes was 9.08 in group I and 9.02 in group II. The difference was non- significant ($P > 0.05$). There was a non- significant difference in change in systolic and diastolic blood pressure in both groups ($P > 0.05$). The number of requirement of doses were 1 time seen in 5 in group I and 11 in group II, 2 times seen 12 in group I and 7 in group II, 3 times seen 6 in group I and 5 in group II, 4 times seen 3 in group I and 3 in group II, 5 times seen in 1 in group I and 2 in group II and 6 times seen 1 subject in group I and group II each. The difference was significant ($P < 0.05$).
Conclusion: When it came to blood pressure maintenance during spinal anesthesia for caesarean sections, intravenous norepinephrine and mephentermine were comparable.
Keywords: caesarean section, mephentermine, norepinephrine

Introduction

Due to anesthetic blockage up to the T4 level, 80% of parturients after caesarean section (CS) have been observed to experience spinal anaesthesia induced hypotension (SAIH). Both the mother and the unborn child suffer from severe and persistent SAIH.[1] Choosing the best management plan for SAIH during CS is one of the primary issues in obstetric anesthesia. For SAIH, numerous methods and vasopressors were investigated; however, no one approach was deemed sufficient or better than the others.[2] Mothers experience hypotension as a result of vasodilatation brought on by spinal block-induced sympatholysis. Fetal hypoxia and acidosis can result from a drop in systolic pressure because it can impair uterine blood flow and fetal circulation.[3]

Mephentermine is a mixed sympathomimetic that primarily stimulates β receptors indirectly. It is one of the most widely used medications that has been demonstrated to be just as safe and effective for SAIH as ephedrine.[4] In numerous studies for SAIH, norepinephrine—which is frequently administered in septic shock—has demonstrated encouraging outcomes in terms of maternal hemodynamic stability. In addition to being a modest β-agonist, it is a strong α-agonist.[5] The present study compared intravenous norepinephrine and mephentermine for maintenance

of blood pressure during spinal anaesthesia for caesarean section.

Materials &Methods

The present study consisted of 56 parturients selected for elective caesarean section (CS) under subarachnoid block (SAB). All subjects voluntarily gave their written consent for the participation in the study.

Data such as name, age, etc. was recorded. They were split into two groups of 28 each. For SAIH, group I subjects got intravenous boluses of 8 µg norepinephrine, while group II subjects received 6 mg Mephentermine. In both groups, parameters like Apgar score, systolic and diastolic blood pressure, and side effects were noted and compared. The results were compiled and subjected for statistical analysis. P value less than 0.05 was set significant.

Results

Table: I. Comparison of parameters

Parameters		Group I	Group II	P value
Age (years)		23.5	25.6	0.12
Height (cm)		160.2	163.5	0.64
Weight (Kgs)		62.7	64.8	0.58
Duration of surgery (mins)		49.3	46.2	0.24
APGAR score	At 1st minute	7.35	7.41	0.51
	At 5 minutes	9.08	9.02	0.47

Table I shows that the mean age in group I subject was 23.5 years and in group II was 25.6 years, height was 160.2 cm in group I and 163.5 cm in group II, weight was 62.7 kgs in group I and 64.8 kgs in group II, duration of surgery was 49.3 minutes in group I and 46.2 minutes in group II, APGAR score at 1st minute was 7.35 in group I and 7.41 in group II and at 5 minutes was 9.08 in group I and 9.02 in group II. The difference was non-significant (P> 0.05).

Table: II. Comparison of systolic and diastolic blood pressure

Minutes	Blood pressure	Group I	Group II	P value
10	SBP	120.4	116.4	0.13
	DBP	68.0	70.2	0.25
20	SBP	118.4	114.8	0.51
	DBP	67.8	68.4	0.46
25	SBP	114.8	104.4	0.82
	DBP	65.2	68.2	0.72
30	SBP	108.2	100.4	0.18
	DBP	62.8	65.6	0.51
40	SBP	100.5	102.6	0.12
	DBP	63.6	67.2	0.54

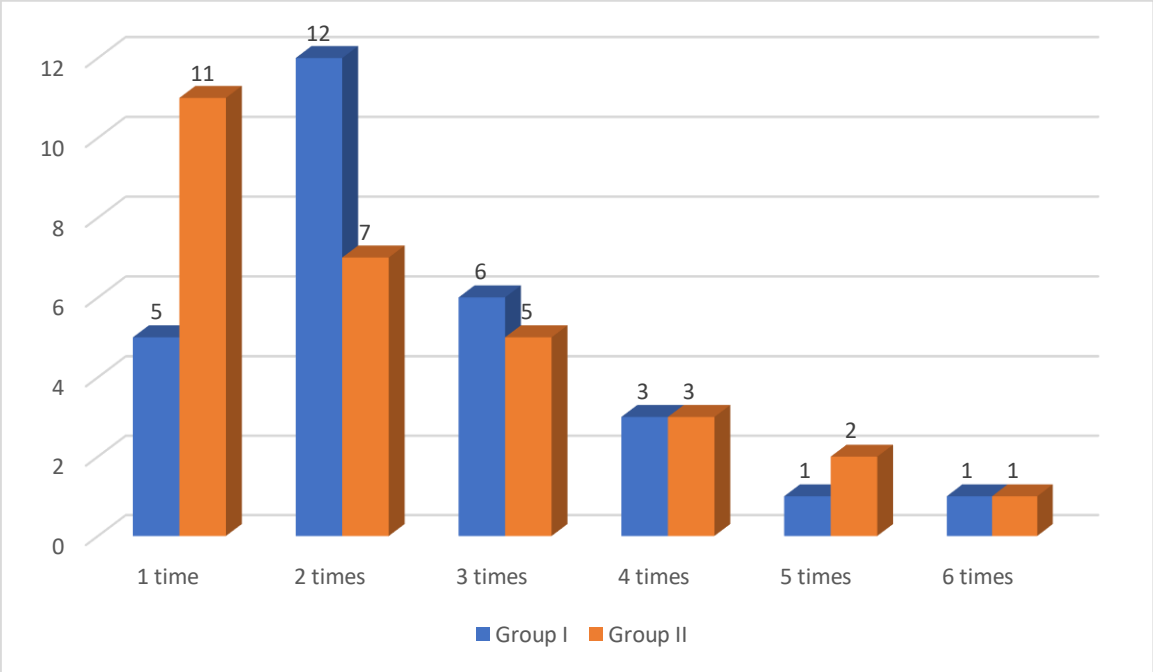
Table II shows that there was a non- significant difference in change in systolic and diastolic blood pressure in both groups (P> 0.05).

Table: III. Number of boluses of norepinephrine and Mephentermine administered

Number	Group I	Group II	P value
1 time	5	11	0.03
2 times	12	7	
3 times	6	5	
4 times	3	3	
5 times	1	2	
6 times	1	1	

Table III, graph I shows that the number of requirement of doses were 1 time seen in 5 in group I and 11 in group II, 2 times seen 12 in group I and 7 in group II, 3 times seen 6 in group I and 5 in group II, 4 times seen 3 in group I and 3 in group II, 5 times seen in 1 in group I and 2 in group II and 6 times seen 1 subject in group I and group II each. The difference was significant (P< 0.05).

Graph: I. Number of boluses of norepinephrine and Mephentermine administered



Discussion

Because it allows for early mother-baby bonding, early breastfeeding initiation, quicker recovery of gastrointestinal functions following surgery, early mobilization, improved postoperative analgesia, and a decreased risk of placental drug transfer, SAB has been the preferred anesthesia technique for caesarean sections.[6]Nevertheless, concomitant sympatholysis causes a reduction in systemic vascular resistance and triggers the Bezold-Jarisch response, resulting in bradycardia, hypotension, and vasodilation that may be harmful to the parturient and the unborn child.[7] The compression of the aorta exacerbates this. Severe and prolonged SAIH impairs uteroplacental circulation, resulting in subsequent fetal hypoxia, bradycardia, acidosis, and neurological damage.[8] It also raises the risk of nausea-vomiting, aspiration, acute renal failure, and altered mental status in parturients.Clinical practice has employed a number of strategies to prevent and manage SAIH, including left tilt, compression stocking wrapping of lower limbs, preloading/coloading with crystalloid/colloid infusion, using an ideal local anesthetic to achieve the ideal height, and using vasopressors and inotropes.[9]The present study compared intravenous norepinephrine and mephentermine for maintenance of blood pressure during spinal anaesthesia for caesarean section.

We found that the mean age in group I subject was 23.5 years and in group II was 25.6 years, height was 160.2 cm in group I and 163.5 cm in group II, weight was 62.7 kgs in group I and 64.8 kgs in group II, duration of surgery was 49.3 minutes in group I and 46.2 minutes in group II, APGAR score at 1st minute was 7.35 in group I and 7.41 in group II and at 5 minutes was 9.08 in group I and 9.02 in group II. While a bolus injection of 6µg norepinephrine was found to be effective in the previous dose-finding study, Ganeshanavar et al.'s[10] comparative dose-response analysis showed that the relative potency of norepinephrine: phenylephrine when given as a bolus for restoring BP in SAIH in obstetric patients was 13.1:1.0. They also found that phenylephrine 100µg was equivalent to norepinephrine 8 µg. As a result, we calculated the relative potencies of mephentermine and norepinephrine and employed equipotent dosages of 6 mg mephentermine and 8µg norepinephrine.

We found that there was a non- significant difference in change in systolic and diastolic blood pressure in both groups (P> 0.05). We found that the number of requirement of doses were 1 time seen in 5 in group I and 11 in group II, 2 times seen 12 in group I and 7 in group II, 3 times seen 6 in group I and 5 in group II, 4 times seen 3 in group I and 3 in group II, 5 times seen in 1 in group I and 2 in group II and 6 times seen 1 subject in group I and group II each. Onwochei et al[11] studied the effect of different intermittent i.v. boluses of norepinephrine to prevent SAIH in caesarean delivery. The results obtained were feasible and were not associated with significant maternal or fetal adverse effects.To determine whether norepinephrine has similar or better effects than mephentermine, Shah et al[12] examined the effects of intermittent intravenous boluses of norepinephrine and commonly used mephentermine for the treatment of SAIH during caesarean sections (CS). 256 parturients who were scheduled for elective CS under SAB were randomized into Group-N and Group-M (n = 84), and they were given intravenous boluses of mephentermine (6 mg) for SAIH and norepinephrine (8µg) for SAIH. Analysis was done on maternal problems, response percentage, heart rate (HR),

diastolic blood pressure (DBP), systolic blood pressure (SBP), and Apgar score. In both groups, the SBP and DBP changes were similar. Throughout the trial period, it was considerably high compared to the first hypotensive value in both groups and significantly reduced after SAB compared to baseline (<0.0001). For the first 10 minutes, HR was similar, but after that, it was noticeably higher in Group-M (<0.0001) until 40 minutes. Group-N had a considerably higher response percentage following the first bolus (59.30n ± 29.21 vs. 39.78 ± 25.6; P = <0.0001).

The limitation of the study is small sample size.

Conclusion

When it came to blood pressure maintenance during spinal anesthesia for caesarean sections, intravenous norepinephrine and mephentermine were comparable.

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