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COMPARISION OF BOLUS PHENYLEPHRINE AND EPHEDRINE FOR MAINTAINING OF BLOOD PRESSURE DURING SPINAL ANAESTHESIA IN LOWER UTERINE CAESAREAN SECTION.

Anaesthesiology

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ABSTRACT

It is more than 125 years since spinal anaesthesia was first used in a surgical procedure. During this period a lot has been learnt except for the fact that it is a simple technique with little sophistication. Today anesthesiologists throughout the world use it successfully for performing various surgeries specifically cesarean deliveries and those involving lower abdomen, urological and lower limbs as well.

One of the controversial issues related with use of spinal anaesthesia is its hypotensive effect which is widely studied in cesarean procedures owing to the compounding effect of aortocaval compression and peripheral vasodilatation leading to decrease in cardiac output[1,2,3]. Even in non-obstetric surgeries incidence of hypotension has been reported to be around 33%[1,2]. The incidence of hypotension depends on the desired block height, age of patient, location of spinal puncture site and baseline systolic blood pressure. No doubt hypotension during spinal anaesthesia is a frequent occurrence in lower uterine cesarean section and despite numerous attempts to try drugs which could restrict this incidence it continues to be cause of concern for an anesthetist.

Use of some adjuvant drugs such as Phenylephrine and Ephedrine is quite common in order to tackle the problem of hypotension in LSCS under spinal anaesthesia. These drugs have been shown to vary in their efficacy depending on the route of administration, dosage and protocol in which they are used.

Considering the high incidence of hypotension during LSCS under spinal anaesthesia, a preemptive approach is recommended by some researchers[4,5]. However some other researchers are of the view that a preemptive vasopressor might affect the rostral spread of spinal anaesthesia, hence bolus maintenance is recommended by some other workers as and when hypotensive events take place.

Although the three drugs are being used effectively with minor differences in their performance however, most of the literature on this issue generally addresses their use in cesarean section[6].

KEYWORDS

Spinal Anaesthesia, Hypotension, Vasopressor, Apgar.

Aims:

1. To observe the efficacy of Bolus Phenylephrine and Ephedrine at equipotent doses for Maintenance of Blood Pressure during SA for LUCS and compare their effects.
2. To observe and compare the neonatal outcome in the two groups using APGAR Score.
3. To observe the side-effects, if any, associated with the test drugs intra operatively.

1.Introduction:

In caesarean section under spinal anaesthesia hypotension has been reported in as many as 85% of the patients.Maternal hypotension is associated with distressing symptoms like dizziness, nausea, vomiting and may also interfere with surgical procedure. It can also cause foetal bradycardia and acidosis. Careful positioning and volume preloading or co-loading[7](more physiological) with crystalloid or colloids have been used to prevent hypotension during SA, but these are not complete measures and vasopressor is required to correct hypotension quickly. Infusion of large volume of crystalloids over a short period of time also carries a risk of pulmonary oedema.

2.Materials and Methods:

INCLUSION CRITERIA:

1. Patients scheduled for elective as well as emergency lower segment Caesarean section.
2. Aged between 18-35 years.
3. ASA Class I and II patients

EXCLUSION CRITERIA:

1. Patients who refuse to participate in the study.
2. Patients with significant coagulopathies and other contraindications for spinal anaesthesia.
3. Patient with pregnancy induced hypertension
4. Patients with history of significant systemic disorders (cardiovascular, respiratory or central nervous system)
5. Patients on Vasoactive drugs

Methodology:

After obtaining the clearance from hospital ethical committee, Eighty parturients of American Society of Anesthesiologists (ASA) type 1 and 2 scheduled for elective as well as emergency LSCS under SA was selected. Hypotension (defined by decrease in MAP below 20% of baseline) .These patients were allocated into 2 equal groups of 40 each to receive-

Group P-Phenylephrine 50 microgram,

Group E- Ephedrine 5 mg as bolus IV,

Either one of the study drug on the first episode of hypotension (MAP < 20%) that occurs after spinal anaesthesia and there after every hypotension (MAP < 20%) within the intra-operative period.

Written and informed consent was obtained from all the patients included in the study and standard institutional pre-operative advice followed.

3. Results:

The study comprises 80 parturents in each group between 18yrs to 35 yrs with ASA grade 1/1E/2/2E undergoing lower uterine cesarean section. The patients were divided into 2 groups of 40 each, depending on the drug they received.

Group P-Phenylephrine 50 microgram as bolus IV

Group E- Ephedrine 5 mg as bolus IV

The following demographic and clinical observations were made from the data collected during our study.

Comparison of Demographic Variables of Study Population

Table 1

	Group			
	Phenylepherine	Ephedrine		
	Mean ± Std. Deviation	Mean ± Std. Deviation	p Value	Significance
Age (Yrs)	29.4 ± 3.18	29 ± 3.51	0.595	Not Significant
Weight (Kg)	71.03 ± 10.86	70.43 ± 9.78	0.796	Not Significant
Height (Cm)	156.6 ± 9.46	155.65 ± 9.03	0.647	Not Significant

Table 2

		Group		Total	p Value	Significance
		Phenylepherine	Ephedrine			
ASA Grade	1.	22(55)	22(55)	44(55)	0.977	Not Significant
	1E	6(15)	5(12.5)	11(13.75)		
	2.	8(20)	8(20)	16(20)		
	2E	4(10)	5(12.5)	9(11.25)		
Total		40(100)	40(100)	80(100)		

Table 3

		Group		Total	p Value	Significance
		Phenylepherine	Ephedrine			
Max Sensory Level	D4	3(7.5)	2(5)	5(6.2)	0.644	Not Significant
	D6	37(92.5)	38(95)	75(93.8)		
Total		40(100)	40(100)	80(100)		

Comparision of Max Sensory level achived

One minute APGAR Score.

		group		Total	p Value	Significance
		Phenylepherine	Ephedrine			
APGAR SCORE 1 min	8	14(35)	14(35)	28(35)	0.895	Not Significant
	9	23(57.5)	24(60)	47(58.75)		
	10	3(7.5)	2(5)	5(6.25)		
Total		40(100)	40(100)	80(100)		

Intra-operative Adverse effects / complication of the two groups:

Adverse Effects	Phenylepherine	Ephedrine
Bradycardia	7(17.5)	1(2.5)
Headache	1(2.5)	1(2.5)
Nausea	1(2.5)	1(2.5)
Vomiting	1(2.5)	0(0)
Neurological Deficit	0(0)	0(0)

4. Discussion:

In present study, Ephedrine and Phenylepherine was found to be equally effective as almost all patients had hypotension in the two study groups and they required the study drug to be given. The mean of number of rescue doses used for hypotension in Group – P was 2.65 and a SD of 1.92 and the number of rescue doses used for hypotension in Group – E was 2.73 and a SD of 1.82 with a 'p value' of 0.859 which is not significant.

Neonatal assessment by APGAR scoring at 1st and 5th min was comparable and more than 8 in both the groups. The p value of 1min was 0.895 and 5 min was 0.223.

Blood Pressure (SBP/DBP/MAP):

In the present study both the vasopressor, effectively maintained SBP within the 20% limit of the baseline. Phenylepherine maintained better in the first 5 min of bolus dose as compared to Ephedrine, this may be due to the faster onset of action of phenylepherine as compaired to ephedrine

Heart Rate:

In this study there has been significant fall in heart rate in the Phenylepherine group but the p value have been insignificant(Table – 7). There has been found to have reduced heart rate when multiple bolus doses of phenylepherine was given and it was more in the later part of the study

Neonatal outcome:

In the study neonatal assessment which was done by APGAR scoring at 1min and 5min was more than 8 in both the groups . The APGAR score has only increased from 8 and above between the 1st minute and the 5th minute.

5.Conclusion:

On the basis of the observation made in the above study we conclude that Phenylepherine and Ephedrine at equipotent doses when administered in LSCS under Spinal anaesthesia has equal efficacy in maintaining the blood pressure and does not cause any significant adverse effect in the maternal or the foetal outcome. Phenylepherine has shown to cause reduction in heart rate.

This requires further studies to establish the facts.

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