



## Anaesthesiology

## EVALUATION OF EPIDURAL PHENYLEPHRINE ON THE HEMODYNAMICS INDUCED BY ALKALINIZED LIGNOCAINE EPIDURAL ANESTHESIA

Dr. D. Sivakanth\* MD, MMC, Chennai \*Corresponding Author

Dr. Ravi MD, MMC, Chennai

**ABSTRACT** **Introduction:** Epidural bupivacaine and lignocaine has been studied extensively in the past, the use of both local anesthetic in neuraxial anesthesia is associated with hypotension if used in higher concentration and volumes. Alpha adrenergic agonist have been used as an adjuvant to epidural local anesthetic to improve the quality of analgesia after major abdominal surgeries. Hence we studied the hemodynamic changes associated with phenylephrine in Epidural lignocaine anesthesia.

**Materials And Method :** A prospective randomised case control study done after obtaining ethical committee clearance and written informed consent of 60 adult patients, 15 patients in each group admitted in Tanjavur medical college hospital for below umbilical surgery. Patients were randomly divided into four groups, namely group 1 Lignocaine 2% 17 ml with 3ml of sodabarbonate with 0.5ml of distilled water, group 2 Lignocaine 2% 17 ml with 3 ml of sodabarbonate with 0.5 ml of 50 mics phenylephrine, group 3 Lignocaine 2% 17 ml with 3 ml of sodabarbonate with 0.5ml of 100micsphenylephrine, group 4 Lignocaine 2% 17ml with 3 ml of sodabarbonate with 0.5ml of 200 mics phenylephrine, and compared.

**Results:** We found statistically significant difference between all groups 1-4, using one way ANOVA. There is a significant difference between group 4 and all other groups in heart rate and mean blood pressure. There is a significant reduction in ephedrine dose in group 4 when compared to other groups.

**Conclusion:** We conclude phenylephrine in a dose of 10 mics/ml of local anesthetic epidurally produces marked hemodynamic stability and decreases the use of vasopressors.

**KEYWORDS :** Epidural phenylephrine, hemodynamic stability

## INTRODUCTION:

Epidural bupivacaine and lignocaine has been studied extensively in the past, the use of both local anesthetic in neuraxial anesthesia is associated with hypotension if used in higher concentration and volumes. Epidural anesthesia can reduce the adverse physiologic response to surgery such as autonomic hyperactivity, cardiovascular stress, tissue break down, increased metabolic rate, pulmonary dysfunction and immune system dysfunction. Epidural anesthesia is widely regarded as a boon for patients as it can provide a relief from pain for a longer duration and the facility of further top-ups and continuous infusion of the analgesic drugs through epidural catheter thus providing an uneventful and smooth recovery. Alpha adrenergic agonist have been used as an adjuvant to epidural local anesthetic to improve the quality of analgesia after major abdominal surgeries. Hence we studied the hemodynamic changes associated with phenylephrine in Epidural lignocaine anesthesia.

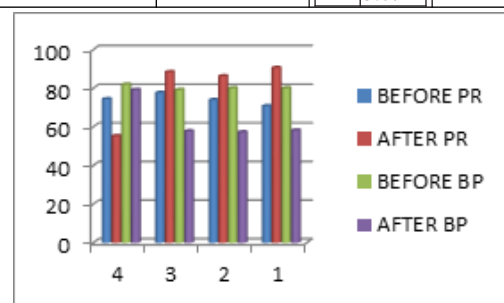
## MATERIALS AND METHOD

A prospective randomised case control study done after obtaining ethical committee clearance and written informed consent of 60 adult patients, 15 patients in each group admitted in Tanjavur medical college hospital for below umbilical surgery. Patients were randomly divided into four groups, namely group 1 Lignocaine 2% 17 ml with 3ml of sodabarbonate with 0.5ml of distilled water, group 2 Lignocaine 2% 17 ml with 3 ml of sodabarbonate with 0.5 ml of 50 mics phenylephrine, group 3 Lignocaine 2% 17 ml with 3 ml of sodabarbonate with 0.5ml of 100micsphenylephrine, group 4 Lignocaine 2% 17ml with 3 ml of sodabarbonate with 0.5ml of 200 mics phenylephrine. After confirming the epidural placement 17 ml 2% lignocaine with 3ml of sodabarbonate was administered with any one of the doses of phenylephrine. Vital parameters were continuously monitored and recorded every 5 minutes for the first 60 minutes, then every 10 minutes upto 120 minutes. Hypotension was defined as decrease in MAP by  $\geq 20\%$  from baseline. Inj. ephedrine 6mg i.v. was given if SBP decreased by 100mmHg ( $\leq 80\%$ ). Bradycardia (less than 60/min) was treated with Inj. Atropine 0.6mg

## RESULTS

On evaluation of the height and weight in the study groups, we found that mean weight, of groups 1 to 4 were (67.6, 68.2, 67.6, 69.8) respectively, mean height, of groups 1 to 4 were (165.1, 164.6, 164.6, 165.3) found comparable no significant difference between groups in patients profile.

Parameter	Before		After		Statistical Inference
	Mean		Mean		
Mean PR	4	74.4	4	55.3	F=34.32 0.001<0.05
	3	77.7	3	88.4	
	2	74	2	86.3	
	1	70.8	1	90.6	
Mean BP	4	82	4	79.2	F=45.9 0.001<0.05
	3	79.2	3	57.8	
	2	80.1	2	57.3	
	1	80.2	1	58.2	
No. Of Ephedrine Doses			4	0.07	F=17.4 0.001<0.05
			3	2.07	
			2	3.47	
			1	3.67	



We found statistically significant difference in pulse rate and mean arterial blood pressure between groups compared by one way ANOVA. There is a significant reduction in ephedrine dose in group 4 when compared to other groups.

## DISCUSSION

Phenylephrine has been used in different routes to attenuate hypotension during neuraxial blockade. Stanton-Hicks used phenylephrine epidurally in a dose of 50 mics/ml, Cheng et.al<sup>1</sup> and Kim et.al<sup>2</sup> have used phenylephrine epidurally in a dose of 10 mics/ml. Stanton-Hicks<sup>1</sup> also observed a significant bradycardia while using epidural phenylephrine in a dose of 50 mics/ml. Our study, ephedrine requirement was meagre with 200 mics phenylephrine, Cheng et.al<sup>1</sup> have also observed similar results. Phenylephrine given iv has a duration of 2-5 mins. Stanton-Hicks<sup>1</sup> showed hemodynamic stability lasted for 60 mins when phenylephrine was given epidurally, in our

study we also observed a similar hemodynamic stability which lasted for similar duration but only when used in a dose of 200mics. *Ayorinde et.al* <sup>4</sup>.have used 4mg im,2mg im phenylephrine and found 4mg phenylephrine is effective to produce hemodynamic stability in patients undergoing caesarean sections under spinal anesthesia.

#### CONCLUSION

We conclude that phenylephrine in a dose of 10 mics/ml of local anesthetic epidurally produces marked hemodynamic stability and decreases the use of vasopressors.

#### REFERENCES

1. Stanton-Hicks et.al. Circulatory effects of peridural block:Comparison of the effect of epinephrine and phenylephrine. *Anesthesiology*.Vol.39,No:3,Sep 1973.
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