Section: Anesthesia

Original Research Article

TO COMPARE THE EFFICACY, HEMODYNAMIC STABILITY AND RECOVERY TIME OF 0.5% HYPERBARIC BUPIVACAINE 1ML VERSUS 1.5 ML FOR SADDLE BLOCK ANAESTHESIA IN PERINEAL SURGERIES

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Received : 03/03/2023
Received in revised form : 09/05/2023
Accepted : 24/05/2023

Keywords:
Regional Anaesthesia, Saddle block, Hyperbaric bupivacaine 0.5%.

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DOI: 10.47009/jamp.2023.5.3.499

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2023; 5 (3); 2548-2552

Abstract

Background: Saddle block Anaesthesia is a technique in regional Anaesthesia which provides Anaesthesia of the perineum, tip of the coccyx, medial and bottom of the buttocks and posteromedial part of the thighs in perineal surgeries. Local anaesthetic agent hyperbaric bupivacaine 0.5% is commonly used in saddle block, and although saddle technique is a popular widely used regional anaesthetic technique it is not free of side effects, therefore attempts have been made to limit the effects of local anaesthetics and to provide benefits to the patients regarding hemodynamic changes and early mobilization. **Materials and Methods:** This was a randomized interventional study conducted in 76 patients in Dr Sushila Tiwari Memorial Government Hospital, Haldwani. Patients were randomly divided in to two groups and were administered saddle block using 2 different doses of drug in each group, patients were then evaluated for level and duration of block, complications, recovery characteristics and intraoperative and postoperative hemodynamic parameters. **Result:** Low dose hyperbaric Bupivacaine in saddle block provided effective and adequate anesthesia which is superior to higher dose in terms of hemodynamic stability and recovery profile. **Conclusion:** Low dose (1ml) hyperbaric Bupivacaine provides effective and adequate saddle block anesthesia in perineal surgeries and is superior to higher dose (1.5ml) in terms of hemodynamic stability and recovery profile. Hemodynamics are more stable in cases with low dose as compared to high dose of bupivacaine, where more patients require treatment for hypotension and bradycardia. With shorter duration of sensory and motor block and early ambulation, low dose hyperbaric bupivacaine should be the preferred anesthetic agent for saddle block anesthesia in perineal surgeries.

INTRODUCTION

Spinal anaesthesia was first described in 1898 in Germany by August Bier and remains a popular technique. Saddle block is a spinal anaesthesia providing sensory and motor block mainly at the perineal region.[1,2] It was described after the second world war and used widely in obstetrics for labour analgesia till the 1960s, when it was replaced by epidural anaesthesia.[3]

Saddle block provides anaesthesia of the perineum, tip of the coccyx, medial and bottom of the buttocks and posteromedial part of the thighs which corresponded to the area in contact with a saddle of a rider.

It is performed by injecting a small dose of hyperbaric local anaesthetic (LA) at the level of L3, L4 after which the patient is maintained in sitting position for a few minutes to facilitate preferential impregnation of sacred roots (S1 to S5), which is responsible for innervation of perineum, external genitalia and anus. The saddle block causes a parasympathetic blockade at the bladder level which may result in bladder and rectal atony which is advantageous because of sphincteric relaxation needed for the operation.[4]

Proctologic surgeries like hemorrhoidectomy, fistulectomy, sphincterotomies, condyloma excision are one of main indications of saddle block. It provides suitable anaesthesia for these painful surgeries that also requires a fully relaxed sphincter. A slightly extended block, decreases, the risk of acute retention of urine, a common complication after these surgeries.[5]

An optimal anaesthetic provides for excellent operating conditions, early discharge, rapid

ISSN (O): 2687-5365; ISSN (P): 2753-6556

recovery, no postoperative side effects, high patient satisfaction, and high quality and low largely replaced hyperbaric lignocaine for spinal anesthesia and is presently the drug of choice.[6,7] Several studies have been done with low dose of bupivacaine in saddle block to provide a short duration effect without significant hemodynamic changes.[8,9] Many attempts have been made to limit the effects of local anaesthetics in subarachnoid space to provide benefits to the patients regarding hemodynamic changes and early mobilization. It's been studied that perineal surgery can be performed by injecting 5 mg (1ml) hyperbaric bupivacaine in subarachnoid space with minimum hemodynamic changes and motor block.[10]

Keeping the above discussion in mind, present study aimed to compare the efficacy, hemodynamic stability and recovery time of 0.5% hyperbaric bupivacaine 1ml (5mg) versus 1.5 ml (7.5 mg) for saddle block anaesthesia in perineal surgeries. The aim of this study was to find out the dose of hyperbaric 0.5% bupivacaine which provides effective anaesthesia for perianal surgery and results in minimum complications and time of stay at hospital after surgery.

MATERIALS AND METHODS

This was a randomized interventional study conducted in 76 patients undergoing surgery under saddle block in Dr Sushila Tiwari Memorial Government Hospital, Haldwani. The sample size was determined by taking in to consideration the prevalence of motor function regain from previous studies, from which the prevalence of rapid motor function regain in group A was taken as 83%. The prevalence of rapid motor function regain in group B was taken as 47%.

Sample size has been calculated by using alpha error of 0.05, at 95% confidence interval and the power of study as 80%. The sample size calculated was 68. But in order to prevent the dropout rate and to keep the sample population constant, we added 10% to the total sample population. (68 + 8 = 76).

The patients were Prospectively randomized to receive either 1ml (Group A) or 1.5 ml (Group B) of 0.5%hyperbaric bupivacaine.

Following the procedure, patients were maintained in sitting position for 20 minutes, and the level and duration of desired sensory blockade was assessed by pinprick method before surgical incision, using a blunted needle. The motor block on each side was assessed separately using a modified Bromage scale along with any complications, recovery characteristics, intra and post op hemodynamic parameters at hourly intervals up to 6 hours min after the injection. in the post anesthesia care unit (PACU).

The data collection procedure included a chart review and patient interview using a questionnaire. The recorded information included the patient's age, gender, body mass index (BMI), ASA grade, duration and level of sensory and motor block, hemodynamic parameters like Heart rate, Respiratory rate, MAP, sp02 and recovery characteristics like time to void urine, time to ambulate, time to home readiness and complications if any such as bradycardia, hypotension, PONV, shivering, PDPH, urinary retention

The anesthesiologist who performed the subarachnoid injection was not involved in the patient evaluations.

All collected data were tabulated and subjected to statistical analysis.

RESULTS

On statistical analysis in the present study the total duration of sensory block (264.87 vs 220.79mins; $p<0.01$) was significantly longer with higher dose of hyperbaric bupivacaine while the Mean duration for onset of sensory block was significantly faster (3.54 vs 4.0 mins; $p<0.01$) [Table 1, Figure 1].

Mean duration for onset of motor block was significantly faster (4.69 vs 5.20 mins; $p<0.01$) while total duration of motor block (179.79 vs 170.51; $p<0.01$) was significantly longer with higher dose of hyperbaric bupivacaine. [Table 2, Figure 2]

The recovery characteristics i.e., time to void urine (264.95(group A) vs 317.84 (group B) mins; $p<0.01$) and time for ambulation (6.96 vs 8.39 hrs.; $p<0.01$) was significantly faster with lower dose of hyperbaric bupivacaine. [Table 3, Figure 3].

Overall complications like bradycardia (10.5% vs 0%), hypotension (13.2% vs 0%) was significantly higher in cases receiving higher dose of hyperbaric bupivacaine. The incidence of post-op shivering (5.3% each) and PONV (2.6% vs 7.9%) were comparable between low and high dose group respectively. [Table 4, Figure 4]

Both the groups were comparable with regards to respiratory rate mean arterial pressure oxygen saturation

The BMI, age group, gender, ASA grade, and mean duration of surgery were not found to be the significant factors with p value>0.05.

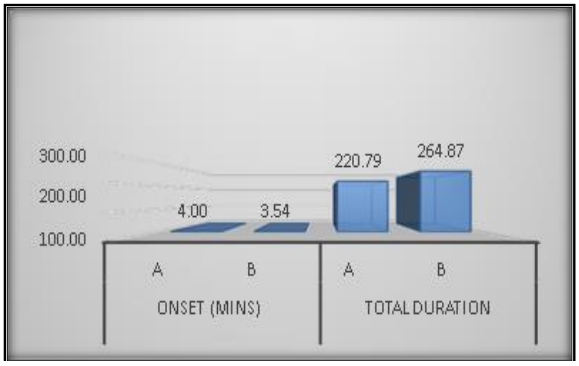

Figure 1: Mean Sensory Block Characteristics

ISSN (O): 2687-5365; ISSN (P): 2753-6556

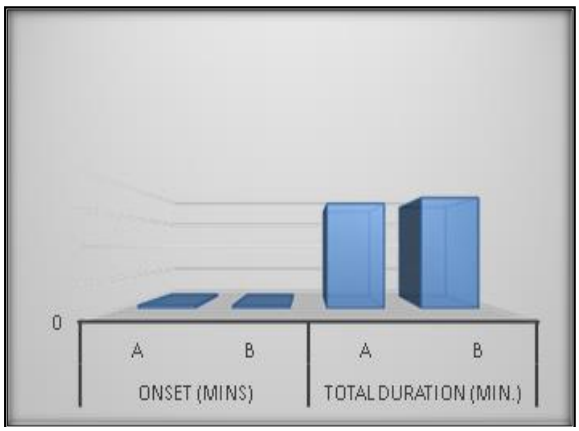

Diagram 2. Mean motor block characteristics comparison among study groups

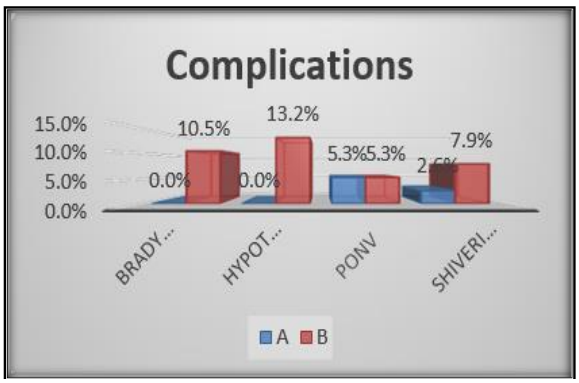

Diagram 4. Distribution of complications among study groups

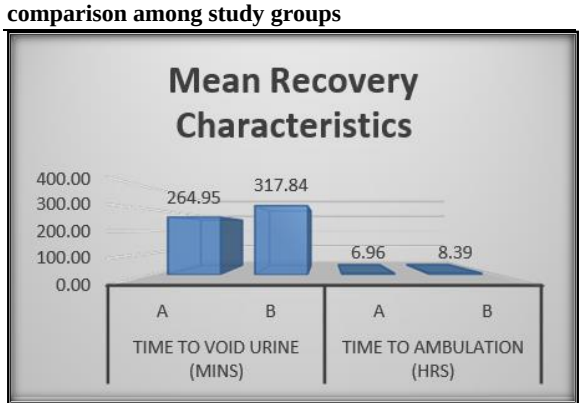

Diagram 3. Mean recovery characteristics comparison among study groups

Table 1: Mean sensory block characteristics comparison among study groups

Sensory Block Characteristics	Group	Mean	SD	p- value
Onset (min)	A	4.00	0.35	<0.01
	B	3.54	0.25	
Total Duration (min)	A	220.79	24.73	<0.01
	B	264.87	31.91	

Table 2: Mean motor block characteristics comparison among study groups

Motor Block Characteristics	Group	Mean	SD	p- value
Onset (min)	A	5.20	0.45	<0.01
	B	4.69	0.38	
Total Duration (min)	A	170.51	23.05	<0.01
	B	179.79	32.30	

Table 3: Mean recovery characteristics comparison among study groups

Recovery Characteristics	Group	Mean	SD	p- value
Time to void urine (mins)	A	264.95	29.68	<0.01
	B	317.84	38.29	
Time to ambulation (hrs)	A	6.96	1.08	<0.01
	B	8.39	1.51	

Table 4: Distribution of complications among study groups

Complications	Group		Total	p- value
	A	B		
Bradycardia	0	4	4	<0.01
	0.0%	10.5%	5.3%	
Hypotension	0	5	5	<0.01
	0.0%	13.2%	6.6%	
PONV	2	2	4	1.00
	5.3%	5.3%	5.3%	
Shivering	1	3	4	0.48
	2.6%	7.9%	5.3%	

ISSN (O): 2687-5365; ISSN (P): 2753-6556

DISCUSSION

Saddle block provides anesthesia of the perineum, tip of the coccyx, medial and bottom of the buttocks and posteromedial part of the thighs covering an area that for a rider would correspond to that in contact with a saddle.[4] Proctologic surgery (e.g., hemorrhoid excision, fistulas, sphincterotomies, condyloma excision) is one of main indications of saddle block.[4]

An optimal anesthetic would provide excellent operating conditions, rapid recovery, early discharge, no postoperative side effects, and high patient satisfaction, in addition to the high quality and low costs of the anesthetic services.[5] Hyperbaric bupivacaine has safely replaced hyperbaric lidocaine for saddle block and is presently the drug of choice.[6,7] However, the optimal dose for the same is still debated, which provide benefits to the patients regarding hemodynamic changes and early mobilization.

In present study, we thus aimed to compare the efficacy, hemodynamic stability and recovery time of 0.5% hyperbaric bupivacaine 1ml (5mg) versus 1.5 ml (7.5 mg) for saddle block anesthesia in perineal surgeries. Study included a total of 76 patients undergoing saddle block anesthesia in perineal surgeries. These patients were prospectively randomized to receive either 1 ml (Group A) or 1.5 ml (Group B) of 0.5% hyperbaric bupivacaine.

Mean age of study cases was 58.35 years with 64.5% females and 35.5% males. Overall, 19.7% cases were in ASA grade I while 80.3% cases were in ASA grade II. Both the groups were comparable with regards to demography, ASA grade, BMI and mean duration of surgery.

Onset & Duration of Sensory & Motor Block

Mean duration for onset of sensory block was significantly faster (3.54 vs 4.0 mins; p<0.01) while total duration of sensory block (264.87 vs 220.79; p<0.01) was significantly longer with higher dose of hyperbaric bupivacaine. Mean duration for onset of motor block was significantly faster (4.69 vs 5.20 mins; p<0.01) while total duration of motor block (179.79 vs 170.51; p<0.01) was significantly longer with higher dose of hyperbaric bupivacaine. These findings are similar to those of Abdulwadood Y et al,[11] who had concluded that level of sensory and motor blockade in spinal anesthesia is proportionate directly to the dose. Similar to their study, we have found that 5mg (1 ml) Bupivacaine in saddle block is associated with faster recovery from sensory and motor blockade.

These findings also match to those of Kazmi SS et al who concluded that 4 mg of 0.75% hyperbaric bupivacaine produces significantly less motor blocked as compared to 7.5 mg with no significant hemodynamic change.

Gudaityte J et al,[10] have also recommended that a dose of 7.5 mg is excessive due to prolonged sensory and motor block. Recovery Characteristics

The recovery characteristics i.e., time to void urine (264.95 vs 317.84 mins; p<0.01) and time for ambulation (6.96 vs 8.39 hrs.; p<0.01) was significantly faster with lower dose of hyperbaric bupivacaine. Abdul Wadood Y et al. in a similar study concluded that 5 mg isobaric bupivacaine is the lower effective dose in spinal anesthesia that provides good operating conditions, rapid recovery and early discharge.

Ali L. et al,[11] in a similar study compared three doses of hyperbaric 0.75% bupivacaine and measuring time for home readiness after day care perianal surgery under saddle block anesthesia and concluded that lower dose of hyperbaric bupivacaine can reduce the time for home readiness compared to higher dose.

These findings also match to those of Valanne J et al who concluded that 4 mg dose appears superior to the 6 mg dose in saddle block Anaesthesia because it produces more Selective anesthesia and allows discharge criteria to be fulfilled significantly faster.

Hemodynamics and Adverse Reactions Both the groups were comparable with regards to baseline hemodynamic parameters and the groups remained comparable throughout the study duration (p>0.05). Overall complications like bradycardia (10.5% vs 0%), hypotension (13.2% vs 0%) was significantly higher in cases receiving higher dose of hyperbaric bupivacaine. The incidence of post-op shivering (5.3% each) and PONV (2.6% vs 7.9%) were comparable between low and high dose group respectively.

Abdulwadood Y et al,[11] in a similar study observed that lower bupivacaine dose is superior in terms of no postoperative anesthetic complications.

Kazmi SS et al,[13] in their study similar to ours observed that there was no significant difference in hemodynamic changes in both groups using 7.5 mg hyperbaric bupivacaine as compared to 4.5 mg dose. However, observed incidence of hypotension and bradycardia was more with 7.5 mg.

Gour V. et al,[14] in a similar study to compare for effects of low dose 4.5mg of bupivacaine over high dose 5.5 mg observed higher incidence of hypotension in higher dose group and recommended low dose of bupivacaine (0.5% less than 4.5 mg) or perianal surgeries to avoid any complication and early recovery.

Thus, to summarize, low dose hyperbaric Bupivacaine (0.5% hyperbaric bupivacaine 1ml (5mg) provided effective and adequate anesthesia which is superior to higher dose in terms of hemodynamic stability and recovery profile. With shorter duration of sensory and motor block, early recovery and ambulation, the lower dose of hyperbaric bupivacaine should be the preferred for saddle block anesthesia in perineal surgeries.

ISSN (O): 2687-5365; ISSN (P): 2753-6556

CONCLUSION

Low dose (1ml) hyperbaric Bupivacaine provides effective and adequate saddle block anesthesia in perineal surgeries and is superior to higher dose (1.5ml) in terms of hemodynamic stability and recovery profile. Hemodynamics are more stable in cases with low dose as compared to high dose of bupivacaine, where more patients require treatment for hypotension and bradycardia. With shorter duration of sensory and motor block and early ambulation, low dose hyperbaric bupivacaine should be the preferred anesthetic agent for saddle block anesthesia in perineal surgeries.

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ISSN (O): 2687-5365; ISSN (P): 2753-6556