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Original research article

Evaluation of bupivacaine heavy and 2-chloroprocaine for saddle block in perianal day care surgeries: An hospital-based comparative analysis

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Abstract

Aim: The aim of the present study was to compare bupivacaine heavy and 2-chloroprocaine for saddle block in perianal day care surgeries.

Methods: This observational study was conducted in the Department of Anesthesiology at Mamata Academy of Medical Sciences, Bachupally for duration of 12 months. We included 50 patients in each group. Group A (Chlorprocaine group) and Group B (Bupivacaine heavy group).

Results: The mean time for eligibility to discharge from hospital between groups were statistically significant with p value <0. 001. Group A had less mean time (234.58± 20.80 min) compared to group B (340.60±15.55 min). The mean time for length of stay in PACU was less in group A (64.36±6.50 min) as compared to group B (76.24±8.45 min) with p value of <0.001. Mean time taken to ambulate was statistically significant with group A having less mean time (180.40±20.32 min) compared to group B (270.30±20.50 min), with p value of < 0.001. The time taken to void was statistically significant with group A having less mean time (220.50±20.50 min) compared to group B (310.30±22.60 min), with p value of <0.001. There was no difference between the two groups in terms of demographic criteria.

Conclusion: In conclusion saddle block with 2-Chloroprocaine provides satisfactory surgical anesthesia for perianal surgeries when compared to low dose hyperbaric Bupivacaine with earlier hospital discharge and shorter PACU stay and time to ambulation and micturition.

Keywords: Bupivacaine, saddle block, 2-chloroprocaine

Introduction

An optimal anesthetic technique 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 [1]. Selective spinal anesthesia-spinal block with minimal effective doses for a specific type of surgery-has become a very popular technique [2] for some orthopedic and gynecological surgeries [3-5]. Saddle block is a selective spinal anesthesia that directs a small bolus of hyperbaric local anesthetic toward S4-S5 and coccygeal nerve roots [6] and is commonly utilized for perianal surgeries [7-10]. Hyperbaric bupivacaine has safely replaced hyperbaric lidocaine for saddle block [6, 7]. Although saddle blocks with different doses of hyperbaric bupivacaine (1.5-4 mg) have been used previously for minor perianal surgeries [8-10], the optimal effective dose is yet to be determined.

Ambulatory day care surgical procedures have increased worldwide. Spinal anesthesia is safe and reliable technique for surgery of lower abdomen and limbs [11]. However, some of its characteristics like delayed ambulation, risk of urinary retention and pain after block regression may limit its use for ambulatory surgeries. Saddle block provides a reliable but restricted block with good surgical conditions and hence is optimal for perianal surgeries. The ideal anesthetic should have minimal side effects with rapid onset and offset of its effect for early patient discharge [12, 13]. 2-Chloroprocaine is an amino-ester local anesthetic and has very short half-life. Bupivacaine heavy is a long acting amide local anaesthetic agent with comparatively slower onset of action and longer duration. Attempts have been made to tailor spinal anesthesia for specific surgical procedures [2]. Several studies targeting local anesthetic at specific nerve roots supplying the surgical field have demonstrated successful results [3, 14].

The aim of the present study was to compare the bupivacaine heavy and 2-chloroprocaine for saddle block in perianal day care surgeries.

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Materials and Methods

This observational study was conducted in the Department of Anesthesiology, Mamata Academy of Medical Sciences, Bachupally, Hyderabad, for a duration of 12 months. We included 50 patients in each group.

Methodology

Total 100 patients were divided randomly into two groups, Group A and Group B by computer generated random numbers at 1:1 ratio. Group A received 2 ml of 1% 2-Chloroprocaine, group B received 2ml of 0.5% Bupivacaine heavy. Double blinding was done where neither the patient nor the investigator knew about the drug. The patients of ASA physical status grade I and II aged between 18 to 58 years undergoing elective perianal day care surgeries <60 mins duration was included in the study. The patients with bleeding/coagulation disorders, existing neurological disease, sepsis, pregnancy and obesity (BMI> 30kg/m2) were excluded.

After pre-anaesthetic evaluation, all patients received tablet Ranitidine 150 mg orally in the night and were kept nil by mouth for 8 hours for solids and 2 hours for clear liquids. On the day of surgery, in the OT standard monitors like pulse oximetry, NIBP and ECG were connected, and baseline readings were recorded. IV line was secured with 20G iv cannula and coloaded with ringer lactate solution at the rate of 15ml/kg.

Under aseptic precautions, spinal anaesthesia was given at L3- L4 or L4-5 interspace using 25 G Quincke spinal needle with patient in sitting position. The patients were placed in supine after 6-10 minutes to achieve adequate saddle block. The sensory level of the block is assessed in a caudal to cephalad direction by using pin prick examination. The occurrence of clinically relevant hypotension (>20% from baseline values) was treated with ephedrine. Clinically relevant bradycardia was treated with atropine.

The patients were discharged from PACU after achieving modified Aldrete score of ≥ 9 and from hospital after achieving Post Anesthesia Discharge Score system of 10. Time to ambulate and void urine were also noted. Patients were contacted over phone, 24 hr and 7 days following surgery for assessing potential complications. A standardized questionnaire was used to check for the presence of headache, nausea, vomiting and backache.

Statistical analysis

Data were entered in MS-Excel and analyzed in SPSS V 21.0. Descriptive statistics were represented with percentages, Mean with SD. Chi-square test, independent t-test were applied to find significance. $p<0.05$ was considered as statistically significant.

Results

Table 1: Clinical data

	Group A	Group B	P value
Eligibility to discharge from the hospital	234.58± 20.80	340.60 ±15.55	<0.001
Length of stay in PACU (MIN)	64.36±6.50	76.24±8.45	<0.001
Time to ambulate(min)	180.40±20.32	270.30±20.50	<0.001
Time to void urine (min)	220.50±20.50	310.30±22.60	<0.001

The mean time for eligibility to discharge from hospital between groups were statistically significant with p value <0. 001. Group A had less mean time (234.58± 20.80 min) compared to group B (340.60±15.55 min). The mean time for length of stay in PACU was less in group A (64.36±6.50 min) as compared to group B (76.24±8.45 min) with p value of <0.001. Mean time taken to ambulate was statistically significant with group A having less mean time (180.40±20.32 min) compared to group B (270.30±20.50 min), with p value of < 0.001. The time taken to void was statistically significant with group A having less mean time (220.50±20.50 min) compared to group B (310.30±22.60 min), with p value of <0.001.

Table 2: Demographic data

Variables	Group A	Group B
Age	32.58 ± 10.30	34.66 ± 11.29
Height (cm)	170.79 ± 8.27	171.39 ± 8.32
Weight (kg)	78.79 ± 7.99	76.64 ± 7.34
BMI (kg/m2)	26.92 ± 1.2	25.55 ± 1.2
Duration of surgery (min)	7.99 ± 4.65	6.50 ± 3.60
Sex (female/male) 9/15	20/30	22/28

There was no difference between the two groups in terms of demographic criteria.

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Table 3: Complications

Parameter	**Group A**	**Group B**
No complications	34	36
Bradycardia	4	0
Hypotension	0	3
Headache	3	5
PONV	7	0
Backache	3	3

The complications in our study like bradycardia, hypotension, headache, PONV and backache were comparable between the two groups.

Discussion

The incidence of perianal surgery varies among institutions, accounting for up to 10% of general surgical procedures. The procedure is suitable to perform on a day-case basis with spinal anaesthesia. However, prolonged sensory and motor block and urinary retention can cause a delay in discharge [15, 16]. It was widely used in Anglo-Saxon countries until the 1960s, especially in obstetrics, before being replaced by more flexible epidural anesthesia [17]. Saddle block provides anaesthesia 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. Such anaesthesia is obtained by injecting a small dose of hyperbaric local anaesthetic (LA) in a patient in the sitting position and maintained in sitting position for a few minutes to facilitate preferential impregnation of sacral roots (S1 to S5) 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 for the operator.

Saddle block is advantageous in terms of usage of small dose of local anesthetic, simplicity to perform and offers rapid onset of action, reliable surgical analgesia with good muscle relaxation. The study conducted by Liu SS [18] *et al*. showed that long acting anesthetics such as bupivacaine can be administered for outpatient surgeries but optimum dose is needed. Bupivacaine heavy is a long acting amide local anaesthetic agent with comparatively slower onset of action and longer duration. 2-chloroprocaine is an amino-ester local anesthetic with a short half-life. Since 1952 it has been successfully used for spinal anesthesia [19]. Many reports of neurotoxicity were reported following the use of large doses of 2-chloroprocaine and hence was withdrawn from commercial use [20-22].

The mean time for eligibility to discharge from hospital between groups were statistically significant with p value <0. 001. Group A had less mean time (234.58± 20.80 min) compared to group B (340.60±15.55 min). Yoos JR and Kopacz DJ [23] conducted double blind, randomized crossover study on 8 healthy volunteers concluded that time to simulated discharge (including time to complete block regression, ambulation and spontaneous voiding) was significantly longer with bupivacaine (191± 30 min) as compared to 2-Chloroprocaine (113±14min). In the study conducted by Lacasse MA *et al*. [24] conducted on 106 patients undergoing outpatient surgery under spinal anesthesia, mean time to hospital discharge was 277±87 min for chloroprocaine group as compared to 353±99 for bupivacaine group.

The mean time for length of stay in PACU was less in group A (64.36±6.50 min) as compared to group B (76.24±8.45 min) with p value of <0.001. However, in the study conducted by Lacasse MA *et al*. [24] mean duration of stay in PACU was 67±16 min in chloroprocaine group and 68±14 which was statistically insignificant with p=0.66. The time taken to void was statistically significant with group A having less mean time (220.50±20.50 min) compared to group B (310.30±22.60 min), with p value of <0.001. Mathur V *et al*. [25] conducted a study on 100 patients undergoing ambulatory urology surgery under spinal anesthesia. According to their study time to first void in chloroproacine group was lesser (177.46 33.41 min) than bupivacaine group (277.56 43.31 min) which was similar to our study. Mean time taken to ambulate was statistically significant with group A having less mean time (180.40±20.32 min) compared to group B (270.30±20.50 min), with p value of < 0.001. In a review study by Ghisi D, Bonarelli S [26] they concluded that 1% 2-chloroprocaine showed faster unassisted ambulation and discharge from hospital. In the study conducted by Lacasse MA *et al*. [24] conducted on 106 patients undergoing outpatient surgery under spinal anesthesia, mean time to ambulate was lesser in chloroprocaine group (225 56 min) as compared to bupivacaine group (265 65 min), the results being similar to our study.

Conclusion

In conclusion saddle block with 2-Chloroprocaine provides satisfactory surgical anesthesia for perianal surgeries when compared to low dose hyperbaric Bupivacaine with earlier hospital discharge, shorter PACU stay and time to ambulation and micturition.

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