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SPINAL ANAESTHESIA FOR PERINEAL SURGERIES: A COMPARISON OF 1% 2-CHLOROPROCAINE WITH 0.5% BUPIVACAINE

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ABSTRACT

BACKGROUND AND AIM: Perineal surgeries are frequently performed under Spinal Anaesthesia. 2-Chloroprocaine seems to be promising alternative being a short acting agent. This study was designed to compare 2-Chloroprocaine with 0.5% Bupivacaine for Spinal Anaesthesia in perineal surgeries. Aim is to study the onset of sensory block, motor block, resolution of sensory and motor block, ambulation time, voiding time and patient satisfaction.

METHODS AND MATERIAL: Following approval of institutional ethical committee, this prospective double blinded randomized control study was conducted in 60 patients undergoing spinal anaesthesia. Informed consent was obtained and study sample was divided randomly to two groups. Group A-1% 2-Chloroprocaine (n=30), Group B-0.5% Bupivacaine (n=30).

RESULT: Onset of sensory block was comparable in both groups (P-0.77). But Group A showed faster onset of motor block (P-0.04) and fast regression of sensory (P-0.001) and motor block (P-0.005). Time for first mobilisation (P-0.004) and voiding (P-0.003) were also significantly low in Group A.

CONCLUSION: Spinal 2-Chloroprocaine is similar to 0.5% Bupivacaine in terms of onset of sensory block, but shows faster recovery from block than 0.5% Bupivacaine and early discharge from hospital.

KEYWORDS :

INTRODUCTION:

Perineal procedures are most commonly performed under Spinal Anaesthesia (1), the short duration of procedure and high turnover of cases necessitate the choice of Local Anaesthetic that exhibit fast onset and quick recovery kinetics (2).

For many years Lignocaine was choice of Local Anaesthetic because of its rapid onset and fast recovery from sensory and motor block (130-170 minutes). But TNS was major drawback (3). Over last few years 2-Chloroprocaine has regained its popularity. In 1980 2-Chloroprocaine was withdrawn from market because of its concern about neurotoxicity with large dose of Chloroprocaine solution containing antioxidant, Sodium Bisulphite (4, 5, 6). Use of preservative free Chloroprocaine has not reported any case of neurotoxicity (7). 2-Chloroprocaine is characterised by fast onset and quick recovery time 70-150 minutes. (8).

Bupivacaine is widely used for surgical procedures in lower extremities. Bupivacaine provide prolonged postoperative analgesia and low incidence of TNS. However long duration of action 240-280 minutes may delay recovery of motor function and cause urinary retention and may lead to delayed discharge from the hospital.

Considering the above facts we designed this study to compare 2-Chloroprocaine with 0.5% Bupivacaine for Spinal Anaesthesia in elective perennial surgeries with aim of comparing onset of sensory block, motor block, resolution of sensory and motor block, ambulation time, voiding time and patient satisfaction.

METHODS AND MATERIALS:

After obtaining institutional ethical committee approval, this prospective randomised double blinded study was conducted among 60 patients with written informed consent. Patients of age between 20-60 years belonging to ASA I and II undergoing elective perineal surgeries (fistulectomy, haemorrhoidectomy) were included in this study. Patients with known allergy to study drug, significant neurological diseases (multiple sclerosis, symptomatic herniated lumbar disc, spinal stenosis), contraindications to spinal Anaesthesia (INR>1.3, platelets<75,000, use of Anticoagulant drugs), cardiac and renal diseases were excluded from this study.

Patients were randomly allocated into two groups, Group A -1% 2-Chloroprocaine 40mg(n=30), Group B-0.5% Bupivacaine 10mg (n=30)

All patients underwent preanaesthetic checkup, all routine and specific investigations. Patients were premedicated orally with 0.5mg Alprazolam. All baseline parameters like pulse, BP, SPO2 were recorded. Patient received IV bolus of 200ml balanced crystalloid infusion. Spinal puncture was performed in sitting position with 23 G Quincke needle @ L3-L4 interspace. Patient was turned supine, once T10 sensory block has been reached.

Block failure was defined when spread of sensory block has not reached T 10 in 15 mins. Block failure was converted to GA.

Sensory block was assessed by pinprick sensation using 22G sterile needle. Arm (C5,C6)used as reference point. Two segment regression from maximum level of sensory block was considered as duration of sensory block.

Motor block was tested using modified Bromage scale,
0= no block
1=impaired movement at hip, normal knee and ankle movement
2=impaired movement at hip, knee, but normal ankle movement
3=impaired movement at hip, knee and ankle.

Scale of 3 is considered as onset and return to 0 is considered as duration of motor block.

Patient satisfaction was noted using 3 numeric rating scale
1=not satisfied
2=good
3=excellent

Hypotension defined as decrease in systolic blood pressure>30% from baseline, was treated with Ephedrine 5mg IV, which was repeated after 10 minutes if hypotension still present. Bradycardia defined as heart rate <50 treated with Atropine 0.6mg IV.

RESULT:

Of total 60 patients, no patient was excluded based on exclusion criteria, no block failure, no patient was lost during followup.

TABLE 1: DEMOGRAPHIC DATA

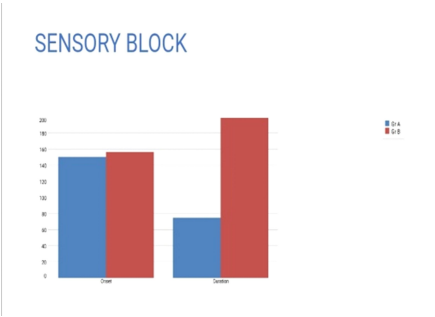
DEMOGRAPHIC DATA

Patient characteristics	Gr A	Gr B	P Value
Age-Range(years) Mean ± SD	26-58 40.933 ± 9.04	24-60 42.2 ± 11.509	0.739
Weight-Range(Kg) Mean ± SD	45-65 56.466 ± 6.65	44-72 57.660 ± 8.20	0.665
Height-Range(Cm) Mean ± SD	140-168 156.4 ± 7.88	142-170 158.33 ± 8.660	0.542
Gender Male:Female	7:8	6:9	0.308
ASA 1:2	5:10	8:7	0.590

TABLE 2: SENSORY BLOCK

Onset of sensory block was comparable in both groups and not significant statistically (P-0.77)

But duration of sensory block was significantly shorter(P-0.001) in Group A.



SENSORY BLOCK

	Gr A	Gr B	P Value
Onset-Range(Sec) Mean ± SD	130-160 150.42 ± 7.77	140-180 156.5 ± 10.21	0.77
Duration-Range(Min) Mean ± SD	60-90 74.64 ± 10.82	180-225 198.92 ± 11.95	0.001

TABLE : 3 Onset and duration of motor block is shorter in Group A than Group B

MOTOR BLOCK

	Gr A	Gr B	P Value
Onset-Range(Min) Mean ± SD	4-8 5.850 ± 1.460	5-9 7.350 ± 1.270	0.04
Duration-Range(Min) Mean ± SD	50-75 59.860 ± 7.17	135-180 158.330 ± 13.620	0.005

MOTOR BLOCK

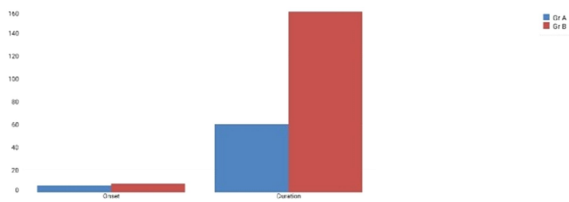


TABLE 4: voiding and ambulation time is shorter in Group A than Group B

VOIDING & AMBULATION TIME

	Gr A	Gr B	P Value
Voiding-Range(Min) Mean ± SD	120-255 185 ± 34.92	180-390 264.60 ± 58.1	0.003
Ambulation-Range(Min) Mean ± SD	135-210 173 ± 29.2	210-330 249.6 ± 45.090	0.004

TABLE 5:

SATISFACTION & COMPLICATIONS

	Gr A	Gr B
Patient Satisfaction (Numeric Rating Scale 1-3)(%)	3(100%)	3(100%)
Per operative Complications;		
Hypotension Bradycardia	0 0	2(6.66%) 1(3.33%)

DISCUSSION:

The purpose of this study was to compare 2-Chloroprocaine with 0.5% Bupivacaine for spinal anaesthesia in perineal surgeries. Our principle findings was spinal with 2-Chloroprocaine can provide satisfactory surgical block, while permitting early ambulation than 0.5% Bupivacaine. This advantage is due to more rapid regression of sensory and motor block, which helps patient ambulate and void faster.(7)

2-Chloroprocaine is an aminoester local anaesthetic with fast onset and short duration of action. In 1980 several reports of neurological deficit, possibly associated with intrathecal injection of large volume of Chloroprocaine was noted. This neurotoxicity was attributed to its preservative sodium bisulphite. Preservative free Chloroprocaine is available as 10mg/ml solution, which was recently approved for intrathecal use.(8)

Chloroprocaine is currently available in US as preservative free solution, as well as with preservative. It should be noted that concentration of preservative in current preparation is 1.8mg/ml, which is less than original solution with neurotoxicity(2mg/ml). But human studies were performed with preservative free Chloroprocaine, so solution containing sodium bisulfite may not be advisible for spinal anaesthesia (8). In a volunteer study of eight patients comparing equivalent doses of spinal 2-Chloroprocaine and Bupivacaine, Yoos et al. Demonstrated a 1.7 times faster regression of sensory block with 2-CP(a difference of 78 min)(9). Breebaart et al. also demonstrated a longer interval to first voiding in patients having spinal anaesthesia with long-acting local anaesthetics (levobupivacaine and ropivacaine) (10).

CONCLUSION:

Spinal Anaesthesia with 40mg of 1% 2-Chloroprocaine is similar to 10mg of 0.5% Bupivacaine in terms of onset of sensory block. But Chloroprocaine has faster regression of sensory and motor block, enables early mobilisation, early voiding because of its short duration of action.

Choosing 2-Chloroprocaine for Spinal Anaesthesia may free up PACU with corresponding decrease in perioperative cost.

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