Original Research Article

To assessand and compare the effect of two doses of chloroprocaine with buprenorphine for saddle anaesthesia in perianal surgery

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Abstract

Introduction: Saddle block is effective in patients experiencing perianal surgery in terms of postoperative recovery and analgesic consumption within 24 hours after surgery. Chloroprocaine was developed to meet the need for a short acting local anaesthetic that is reliable and has a favorable safety profile. **Objectives:** To study two different doses of chloroprocaine with buprenorphine for saddle anaesthesia in perianal surgery. **Material and Methods:** 100 Patients of ASA Gr I & II were taken for perianal surgeries are kept in sitting position under all aseptic and antiseptic precautions SAB was given using 25/23G spinal needle in sitting position. A fixed dose of chlorprocaine with bupernorphine was injected in L4-L5 intervertebral space. Patients were assessed for pain score on VAS in post operative period.Patients were monitored for pulse , BP, respiratory rate , SPO2at regular intervals on a prestructured proforma. All the data were entered in master chart and statistically analysed. **Results:** Mean age of patients in Group A was 41.47 ± 9.06 years whereas in Group B was 35.66 ±12.12 years. The study groups comprised of 68 males and 32 females. Mean heart rate of patients in Group A group in preoperative was 55.52±6.14 whereas in group Group B was 54.80±5.79. Mean HR in Group A and Group B was found statistically insignificant (p=0.547). Mean SBP in Group A in preoperative was 102.9 ±22.41 and in Group B was 101.2±4.79.When we compared the mean SBP in Group A and Group B was found statistically insignificant (p=0.601) and Mean DBP in Group A in preoperative was 83.62±4.79 and in Group B was 83.12±8.7. When we compared the mean SBP in Group A and Group B it was found statistically insignificant (p=0.722). Mean RR in Group A in preoperative was 16.54 ±0.67 and Group B was 16.48 ±0.64 and Mean RR in Group A in intraoperative was 17.1 ± 0.83 and group B was 17.14±078. In our study we compared the mean time taken to achieve sensory block. In group A it was 2.54±0.50 min.. In group B the mean time taken to achieve sensory block was 2.38 ±0.49 min. It appears that 0.8ml Chloroprocaine might causes faster onset of sensory block and the difference between group A and B is statistically significant (p=0.0001). VAS score was significantly high in Group A as compared to Group B at 2nd and 6th hours respectively. Whereas VAS score was comparable at 12 and 24th hours in both the groups as revealed by insignificant p values. **Conclusion:** From our observations and data analysis we reach to the conclusion that for saddle block with higher dose we can allow surgery for longer time but the duration of postoperative analgesia remains same in both the groups

Keywords: Chlorprocaine, Bupernorphine, Saddle block, Perianal surgery

Introduction

Chloroprocaine (trade name Nesacaine or Nesacaine-MPF) is a local anesthetic given by injection during surgical procedures and labor and delivery. It can be used as local anaesthetic for epidural, infiltration, peripheral nerve block and spinal. Placental transfer of 2-chloroprocaine is not influenced by fetal acidosis[1,2]. Chloroprocaine constricts blood vessels leading to reduced blood loss; this can be in distinction to different native anesthetics. Chloroprocaine is an ester anesthetic (Figure 1). Chloroprocaine was developed to meet the need for a short acting spinal anesthetic that is reliable and has a favorable safety profile to support the growing need for day case surgery[3,4].

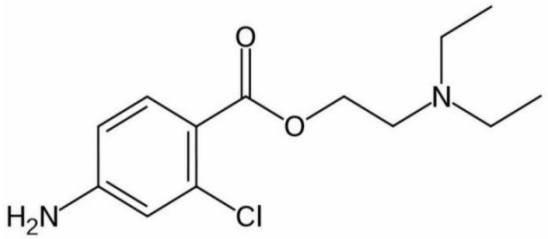

Figure: 1 Chemical structure of chloroprocaine

It is available in concentrations of 1%, 2%, 3%. Chloroprocaine was developed to meet the need of a short acting spinal anaesthetic that is reliable and has a favorable safety profile to support the growing need for day care surgery. Drug of choice for epidural analgesia and a decompensating fetus, because it does not participate in ion trapping.

Objectives

To compare two different doses of choloroprocaine with buprenorphine for saddle block in perianal surgery.

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Material & methods

Observational cross sectional study was done for the period of one and a half year after approval from the ethics committee at Sri Aurobindo Medical College and Post Graduate Institute.

Inclusion criteria

ASA grade I & II.
Both male and female.
Age 18 to 60 years.
Patients undergoing perianal surgeries.
Duration of study up to 1 hour

Exclusion criteria

ASA grade III and IV.
Age <18 and >60 years.
Patient with haemorrhagic diathesis, psychiatric disturbance.
Patients refusal to procedure.
Patient with known allergy to local anaesthesia.

Methodology

Patients were taken for perianal surgeries, were kept in sitting position. Under all aseptic and antiseptic precautions, SAB was given using 25/23G spinal needle in sitting position. A fixed dose of 1% Chloroprocaine (preservative free) with buprenorphine was injected in L4-L5 intervertebral space. Patients were assessed for pain score on VAS in post operative period. Patients were monitored for PULSE, BLOOD PRESSURE, RESPIRATORY RATE, SPO2 at regular intervals on a pre-structured proforma.

Procedure

The patients were recruited from the ward and pre anaesthetic check up was done. An informed, written consent was taken from all the patients. Patients were kept nil by mouth for 8 hours prior to the procedure. Patients were divided into Group A and Group B by randomization with double blinding method where the patient as well as the assessor were unaware about the group divisions. Group A patients received chloroprocaine 1.0 ml with 30 mcg buprenorphine and Group B patients received 0.8 ml chloroprocaine with 30 mcg buprenorphine. Patients were monitored with ECG, HR, NIBP, SpO2 and respiration at regular intervals intra and post- operatively for 24 hours. The assessment of vitals, emergence, sedation and analgesia were made post operatively on a pre- structured proforma. Statistics was used to show the characteristic of the collected sample. The observation between the two groups were compared by using student t test. The association between qualitative parameters was shown by using Chi square test. P value of <0.05 was considered as significant.

Observation and results

Majority of the patients belong to age group of <40 years (39%) followed by 26-30 years (22%). Mean age of patients in Group A was 41.47 ± 9.06 years whereas in Group B was 35.66 ±12.12 years. The study groups comprised of 68 males and 32 females.

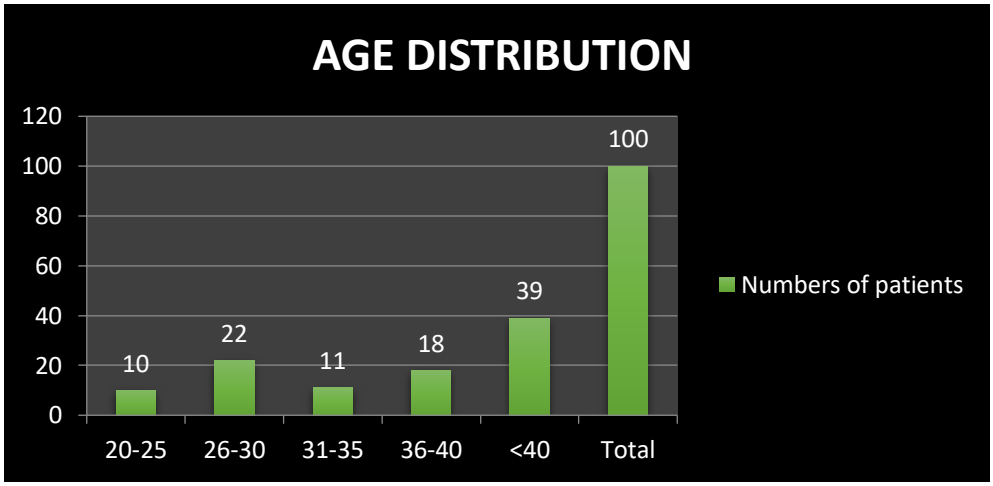

Figure 2: Age distribution

Table 1: Comparing mean age between groups

Group	N	Mean±SD	P value(t test)
Chloroprocaine 1ml,	50	41.47 ± 9.06	0.007*
Chloroprocaine (0.8ml)	50	35.66 ±12.12	
Total	100	38.7 ± 11.08	

Table 2: Comparing baseline parameters between groups in preoperative

Baselines parameters	HR	RR	SPO2	SBP	DBP
Chloroprocaine 1 ml	55.52±6.14	16.54 ±0.67	99.12 ±1.00	102.9 ±22.41	83.62±4.79
Chloroprocaine 0.8 ml	54.80±5.79	16.48 ±0.64	99.20 ±0.98	101.2±4.79	83.12±8.7
P Value	0.547	0.648	0.687	0.601	0.722

Table 3: Comparing baseline parameters between groups in intraoperative (0min)

Baselines parameters	H.R	RR	SPO2	SBP	DBP
Chloroprocaine 1 ml	56.50 ±5.27	16.6±0.69	99.64±0.79	100.4±2.82	91.76±9.95
Chloroprocaine .8 ml	56.50±5.27	16.7±0.76	99.64±0.69	101.2±4.79	91.4±9.05
P Value	-	0.492	0.99	0.31	0.85

Table 4: Comparing baseline parameters between groups in intraoperative (15min)

Baselines parameters	H.R	RR	SPO2	SBP	DBP
Chloroprocaine 1 ml	60.62 ±4.93	17.1 ± 0.83	99.52 ±0.78	106±6.06	94.34±14.94
Chloroprocaine .8 ml	60.56 ±4.79	17.14±078	99.48±0.81	106±6.02	113±147
P value	0.950	0.804	0.801	0.99	<0.001

Table 5: Comparing baseline parameters between groups in intraoperative (30 min)

Baselines parameters	H.R	RR	SPO2	SBP	DBP
Chloroprocaine 1 ml	61.70 ±6.02	17.88±1.23	99.52±0.78	106±5.92	100±12.96
Chloroprocaine 0.8 ml	61.20 ±6.43	17.88±1.18	99.48±0.81	106±5.86	97.36±13.37
P Value	0.689	0.99	0.81	0.99	0.31

Table 6: Comparing baseline parameters between groups in intraoperative (45 min)

Baselines parameters	H.R	RR	SPO2	SBP	DBP
Chloroprocaine 1 ml	63.08 ±6.59	18.16±1.05	99.88±0.47	107±5.55	97.72±19.15
Chloroprocaine 0.8 ml	62.62 ±6.99	18.12±1.00	99.96±0.28	97.36±13.37	97.68±16.37
P value	0.73	0.84	0.303	<0.0001	0.991

Table 7: Comparing baseline parameters between groups in intraoperative (60 min)

Baselines parameters	H.R	RR	SPO2	SBP	DBP	P Value
Chloroprocaine 1 ml	62.22 ± 5.06	16±1.0	100±00	117 ±3.97	89±7.9	<0.001
Chloroprocaine .80 ml	62.22±5.06	17.16±1.16	99.83±0.40	143 ±10.55	93.83 ±3.71	

Table 8: Comparing VAS score between two group groups

VAS SCORE		N	Mean±Std. Deviation	P value(t test)
2	Chloroprocaine 1 ml	50	4.9±1.91	<.001
	Chloroprocaine .80 ml	50	7.5 ±1.51	
6	Chloroprocaine 1 ml	50	4.84 ±2.09	< .00001
	Chloroprocaine .80 ml	50	6.98 ±1.55	
12	Chloroprocaine 1 ml	50	3.47 ± 1.042	p < .05.
	Chloroprocaine .80 ml	50	3.67 ±1.348	
24	Chloroprocaine 1 ml	50	4±0	-
	Chloroprocaine .80 ml	50	4±0	

The p-value is .189637. The result is not significant at p < .05

Table 9: Comparing onset of sensory and motor

Onset of Motor	N	Mean± Std. Deviation	P value
Group A	50	5.08 ± 0.72	0.0001
Group B	50	4.82 ±0.59	

Table 10: Comparing use of Side effects

Side effects	Group		Total	P value
	Group A	Group B		
Nausea and vomiting	15	17	32	0.33
NONE	35	33	68	
Total	50	50	100	

Discussion

In our study, we compared the mean time taken to achieve sensory block. Group B, that is, 0.8 ml Chloroprocaine causes faster onset of sensory block, so addition of 0.8 ml dose of Chloroprocaine with bupernorphine in saddle anesthesia does affect the onset of sensory block. On comparison of motor block onset, 0.8ml dose of chloroprocaine causes faster onset of motor block. So addition of low doses of Chloroprocaine with bupernorphine in saddle anesthesia does significantly affect the onset of motor block. **Ying Zhang et. Al[5] & Gebhardt V et. Al[6]** In present study majority of the patients belong to age group of <40 years (39%) . In Age group 20-25 years there were 10% patients, in 26-30 years 22%, and in 31-35 years there were 11% patients, in 36-40 years there were 18% patients. Mean age of patients in Group A was 41.47 ± 9.06 years whereas in Group B was 35.66 ±12.12 years. Mean age between the groups was comparable as revealed statistically by the p value of 0.007 which was significant. In Group A group there were 13 (26%) female and 37 (74%) males. where as in group Group B there were 19 (38%) females and 31 (62%) males. Sex distribution between groups was comparable as revealed statistically by the insignificant p value of 0.198. The mean age and sex distribution of the patients between two groups were comparable statistically. Similarly, **Teunkens A et. Al[7]** observed no significant difference in sex distribution. In our study we compared the mean time taken to achieve sensory block. In group A it was 2.54±0.50 min.. In group B the mean time taken to achieve sensory block was 2.38 ±0.49 min. It appears that 0.8ml Chloroprocaine might causes faster onset of sensory block and the difference between group A and B is statistically significant (p=0.0001). So addition of 0.8ml dose of chloroprocaine with Bupernorphine in saddle anesthesia does affect the onset of sensory block. These findings of onset of motor and sensory block were in concordance with the study results of **Ying Zhang et al[5] & Gebhardt V et al[6]** observed difference in the onset time in patients receiving different doses of chloroprocaine, which concluded that low doses of chloroprocaine with bupernorphine has a better anesthetic effect in group B than group A, such as walking after saddle anesthesia. In present study at 2, 6, 12

and 24 hour, mean VAS score in Group A was 4.9±1.91,4.84 ±2.09, 6.1±0.30 and 4±0 respectively, whereas in Group B was 7.5 ±1.51, 6.98 ±1.55, 6.58±0.49 and 4±0 respectively. Comparing VAS score we found that At 2, 6, 12 and 24 hour, VAS score between Group A and Group B were, 4.9±1.91vs 7.5 ±1.51 (<.001), 4.84 ±2.09vs 6.98 ±1.55 (< .00001), 3.47 ±1.042 vs3.67±1.348 (.05) and 4±0 v/s 4±0 respectively. VAS score was statistically significantly at 2nd and 6th hours respectively. Whereas VAS score was comparable statistically at 12 and 24th hours in both the groups as revealed by insignificant p values. **V Gebhardt (2016)** found the similar results in their study on VAS score. In our study we did not find any others side effects like urinary retension and PDPH in both the groups. Marie Andrée Lacasse et. al 2011[8] found the similar results on side effects side effects. Hejtmanek MR (2011)[9] was found urinary retention, was similar in both groups.

Conclusion

On the data collected statistical analysis, results and comparison with other studies done earlier, we reach to the following conclusions:

1. Low dose (0.8ml) of chloroprocaine achieves early onset of sensory and motor blockade in saddle block.
2. The duration of postoperative analgesia remains same in both the groups.
3. Rescue analgesia requirement.
4. Patients remained thermodynamically stable.
5. There was nausea and vomiting as side effect and no other side effects.

Recommendation

1. The study can be tried with still lower doses of the drugs.
2. Can be very well used drug for day care surgery

References

1. Abboud TK, Khoo SS, Miller F, Doan T, Henriksen EH. Maternal, fetal, and neonatal responses after epidural anesthesia with bupivacaine, 2-chloroprocaine, or lidocaine. Anesth Analg. 1982; 61(8): 638-44.
2. Kuhnert B, Kuhnert P, Prochaska A, Gross T. Plasma levels of 2- chloroprocaine in obstetric patients and their neonates after epidural anesthesia. Anesthesiology. 1980; 53 (1): 21-5.
3. Stevens RA, Urmey WF, Urquhart BL, Kao T-C. Back pain after epidural anesthesia with chloroprocaine. Anesthesiology. 1993;78(3):492-7
4. Marica LS, O 'Day T, Janosky JE, Nystrom EU. Chloroprocaine is less painful than lidocaine for skin infiltration anesthesia. Anesth Analg. 2002;94(2):351-4.
5. Zhang Y1, Bao Y1, Li L1, Shi D1. The effect of different doses of chloroprocaine on saddle anesthesia in perianal surgery. Acta Cir. Bras. vol.29 no.1 São Paulo Jan. 2014
6. Gebhardt V1, Mueller-Hansen L1, Schwarz A1, Bussen D2, Weiss C3, Schmittner MD1Chloroprocaine 10 mg/ml for low-dose spinal anaesthesia in perianal surgery - a randomised dose finding study. cta Anaesthesiol Scand. 2017 Feb;61(2):241-249.
7. Teunkens A1, Vermeulen K, Van Gerven E, Fieuws S, Van de Velde M, Rex S. Comparison of 2-Chloroprocaine, Bupivacaine, and Lidocaine for Spinal Anesthesia in Patients Undergoing Knee Arthroscopy in an Outpatient Setting: A Double-Blind Randomized Controlled Trial Reg Anesth Pain Med. 2016 Sep-Oct;41(5):576-83
8. Lacasse MA, Roy JD, Forget J, Vandenbroucke F, Seal RF, Beaulieu D, McCormack M, Massicotte L. Comparison of bupivacaine and 2-chloroprocaine for spinal anesthesia for outpatient surgery: a double-blind randomized trial. Canadian Journal of Anesthesia/Journal canadien d'anesthésie April 2011, Volume 58, Issue 4, pp 384–39
9. M. R. HEJTMANEK , J. E. POLLOCK, Chloroprocaine for spinal anesthesia: a retrospective analysis: Department of Anesthesiology Virginia Mason Medical Center: 02 February 2011

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