|| ISSN(online): 2589-8698 || ISSN(print): 2589-868X ||
International Journal of Medical and Biomedical Studies
Available Online at www.ijmbs.info
NLM (National Library of Medicine ID: 101738825)
Index Copernicus Value 2019: 79.34
Original Research Article
Volume 5, Issue 1; January: 2021; Page No. 305-307

INTRATHECAL 1% 2 CHLOROPROCAINE V/S 0.5% HYPERBARIC BUPIVACAINE IN AMBULATORY SURGERY

Dr. Jagdish Kumar[1], Dr. Ramprasad[2]
[1]Senior Resident, Govt. Medical College, Barmer, Rajasthan
[2]Senior Resident, Dr S N Medical College, Jodhpur, Rajasthan

Article Info: Received 04 January 2021; Accepted 30 January 2021
DOI: https://doi.org/10.32553/ijmbs.v5i1.1713
Corresponding author: Dr Ramprasad
Conflict of interest: No conflict of interest.

Abstract
Background: This study was designed to compare 2-CP with bupivacaine for spinal anesthesia in an elective ambulatory setting.
Methods: A total of 100 patients were enrolled in this randomized double-blind study. Spinal anesthesia was achieved with 0.5% hyperbaric bupivacaine 5 mg (n = 50) or 2% preservative-free 2-CP 40 mg (n = 50).
Results -The average time to discharge readiness was 277.12 min in the 2-CP group and 353.11 min in the bupivacaine group, a difference of 76 min.
Conclusion: 2-chloroprocaine provides adequate duration and depth of surgical anesthesia for short procedures with the advantages of faster block resolution and earlier hospital discharge compared with spinal bupivacaine.
Keywords: 2-chloroprocaine, Bupivacaine, Ambulatory surgery.

Introduction

Subarachnoid block (SAB) is a popular and common anaesthetic procedure practices worldwide. It was first performed by August Bier more than a century ago by injecting cocaine into cerebrospinal fluid (CSF) of a patient. Spinal anaesthesia is a safe, economical, easy to perform and effective technique which provides rapid and reliable anaesthesia. It is anaesthesia of choice for lower abdominal and lower limb surgeries. Various local anaesthetic agents commonly used for spinal anaesthesia are lignocaine, bupivacaine, levobupivacaine, and ropivacaine[1,2].

An increasing number of day-care surgical patients are challenging the presently used methods of anaesthesia. Reliable surgical anaesthesia should be fast, with rapid recovery and minimal side effects. To produce reliable spinal anaesthesia with a reasonable recovery time it is essential to understand the factors affecting the spread of spinal block and to choose the optimal drug and adequate dose for specific surgical procedures[3].

Lidocaine has an attractive pharmacokinetic profile as it shows a rapid onset and allows a fast recovery of both motor and sensory block (130- 170minutes).[4] However, when compared with other local anaesthetics, the use of lidocaine for spinal anaesthesia is associated with an increased risk of transient neurological symptoms (TNS) including back and leg pain.[5-7]

Bupivacaine may provide prolonged postoperative analgesia and has a lower incidence of TNS. However, the longer duration of action (240- 380minutes) may delay the recovery of motor function , cause urinary retention, and therefore ultimately may lead to a delayed discharge from the hospital.[8]

Over the last few years, 2-chloroprocaine has regained popularity. While 2-chloroprocaine was withdrawn from the market in the 1980s because of concerns about neurotoxicity,[9-10]a new formulation without preservatives that has no longer been associated with neurotoxicity[11-12] was introduced into clinical routine in 2004. 2-chloroprocaine is characterized by both a very fast onset (5-10minutes) and a quick recovery time (70-150minutes) [13-14].

It has not been systematically studied whether the differences in pharmacokinetics of two local anaesthetics can translate into an improvement of relevant outcomes after spinal anaesthesia in day-care surgery. We want to compare 2-chloroprocaine with Bupivacaine 0.5% Heavy, which is still considered by several authors as criterion standard for spinal anesthesia[18].

Material and Method

Study area:-

ambulatory surgery The present study includes patients undergoing under subarachnoid block.

Study design:

Hospital based Randomized, Double Blind, Interventional study.

Randomization:

It is a statistical procedure by which the participants will be allocated into two different groups.

In this study randomization will be done by sealed envelope. A total of 100 sealed envelopes (50 per group) will be made, each sealed envelope mentioning a particular

study group. One of my colleagues will ask the patient to pick up a sealed envelope from the box. Patient will be allocated to group mentioned on the sealed envelope. Study drug will be prepared by my colleague and will be administered by me to the patient.

Double blinding:

This trial is so planned that the doctor who would prepare and introduce anaesthetic agent will be different from the doctor who will observe the study participants and observe data. The syringe used will be wrapped with white paper.

The patient will be told that some anaesthetic agent would be given, but type of anaesthetic agent will not to be disclosed to them.

Study Group:-

The study will be conducted in following two groups of patients. Each group will consist of 100 patients. (n=50)

- Group A – chloroprocaine group (n=50)

4ml of 1% chloroprocaine

- Group B –bupivacaine group (n=50)

4ml of 0.5% hyperbaric bupivacaine

INCLUSION CRITERIA:-

- Patients aged 20-50yrs
- Patient height >145 cm.
- Patient's body weight 40-80 kg.
- ASA grade I-II.
- Undergoing infraumblical surgery

EXCLUSION CRITERIA:-

- Patient Refusal
- Patients with history of bleeding disorders or patients on anticoagulants, Platelet<75,000.
- Chronic history of headache and backache or any Neurological disease.
- Severe hypovolemia, anemia, compromised renal, cardiac or respiratory status.
- Spinal deformity or infection at the local site.
- Patient allergic to Local Anaesthetic drug
- Failed spinal block

Pregnant women.

Results

Table 1: Demographics profile

Variable	Group-A	Group-B	P-Value
Age in Yrs	42.32±6.11	44.06±7.14	>0.05
Sex (M:F)	27:23	28:22	>0.05
ASA(I:II)	44:6	43:7	>0.05

Both groups were comparable.

Table 2: Outcome

Variable	Group-A	Group-B	P-Value
Time to eligibility for discharge from hospital (min)	277.32±84.23	353.34±93.12	0.001
Time for two-segment regression (min)	46.12±18.23	73.24±37.24	0.001
Time for complete regression to S2 (min)	144.01±38.13	326.56±78.23	0.001
Duration of the motor block (min)	76.12±24.23	127.24±94.12	0.001
Time to ambulation (min)	225.06±36.8	270.31±45.03	0.001

The incidences of complications recorded during the follow-up phone calls (postdural puncture headache, transient neurological symptoms, and back pain) were all similar between groups.

Discussion

The purpose of this study was to compare 2-CP with bupivacaine for spinal anesthesia in an ambulatory surgery setting. Our principal finding was that spinal anesthesia with 2-CP can provide a satisfactory surgical block while permitting an earlier discharge from hospital than spinal bupivacaine. This advantage is due to a more rapid regression of the sensory and motor block, which helps patients ambulate and void faster.

The finding that shows the most significant advantage is the time for regression of the sensory block to S2, as 2-CP was 2.3 times faster than bupivacaine. In a volunteer study of eight patients comparing equivalent doses of spinal 2-CP and bupivacaine, Yoos et al. demonstrated a 1.[19] times faster regression of the sensory block with 2-CP (a difference of 78 min). However, the data of Yoos et al. cannot be compared directly to ours as they used a different method to evaluate the sensory block. In our study, the level of sensory block was assessed using loss of cold sensation to ice, whereas Yoos et al. utilized loss of sensation to pinprick with a dermatome tester. Although the

same nerve fibres transmit pain and cold information, there is a subtle distinction. Pinprick sensation is conducted by the A delta fibres, while cold sensation is transmitted by both the A delta fibres and the C fibres.[20]

The primary outcome of this study i.e the time to eligibility for discharge from hospital, was measured from the time spinal anesthesia was performed to the moment the patient attained all of the discharge criteria. As to this outcome, a significant difference of 76 min was observed in favour of the 2-CP group due to faster regression of the block, resulting in earlier ambulation and earlier voiding. Delayed discharge due to urinary retention was particularly problematic in the bupivacaine group. Even with good block regression and successful ambulation, many patients who received bupivacaine experienced a longer delay between their first attempt and their eventual successful complete voiding. This delay may be explained by the need for a regression of the sensory block to at least the S2 dermatome in order to obtain normal detrusor function. Breebaart et al. also demonstrated a longer interval to first voiding in patients having spinal anesthesia with longacting local anesthetics (levobupivacaine and ropivacaine) compared with those with shorter-acting agents (lidocaine).[21]

Although this study was not designed to measure health care costs, our results could be significant when considered from a cost savings perspective. As health care costs are determined, in part, by the length of hospital stay, achieving faster discharge from hospital through the utilization of 2-CP for spinal anesthesia could provide potential cost savings without compromising the quality of patient care.

Conclusion

2-chloroprocaine provides adequate duration and depth of surgical anesthesia for short procedures with the advantages of faster block resolution and earlier hospital discharge compared with spinal bupivacaine.

References

1. Miller's Anesthesia.7th.edition.vol.1:21
2. James Leonard Corning and the early history of spinal puncture Neurology April 1987 vol. 37 no. 4 672
3. Marx, GF (1994). "The first spinal anesthesia. Who deserves the laurels?" Regional Anesthesia. 19 (6): 429–30.
4. Lim Y, Ocampo CE, Sia AT. A comparison of duration of analgesia of intrathecal 2.5 mg of bupivacaine, ropivacaine, and levobupivacaine in combined spinal epidural analgesia for patients in labor. Anesth Analg 2004;98:235-9.
5. Casati A, Moizo E, Marchetti C, Vinciguerra F. A prospective, randomized, double-blind comparison of unilateral spinal anesthesia with hyperbaric bupivacaine, ropivacaine, or levobupivacaine for inguinal herniorrhaphy. Anesth Analg 2004;99:1387-92.
6. Korhonen AM. Use of spinal anaesthesia in day surgery. *curr opin anaesthesiol.*2006;19:612-
7. Nair GS, Abrishami A, Lermitte J, Chung F. systematic review of spinal anaesthesia using bupivacaine for ambulatory knee arthroscopy. *Br J Anaesth.* 2009;102:307-315.
8. Reisner LS, Hochman BN, Plumer MH. Persistent neurologic deficit and adhesive arachnoiditis following intrathecal 2-chloroprocaine injection. *Anesth Analg.*1980;59:452-454.
9. Ravindran RS, Bond VK, Tasch MD, Gupta CD, Luerssen TG. Prolonged neural blockade following regional analgesia with 2-chloroprocaine. *Anesth Analg.*1980;59:447-451.
10. Hejtmanek MR, Pollock JE. Chloroprocaine for spinal anesthesia: a retrospective analysis. *Acta Anaesthesiol Scand.* 2011;55:267-272.
11. Drasner K. chloroprocaine spinal anesthesia: Back to the future? *Anesth Analg.* 2005;100:549-552.
12. Goldblum E, Atchabahian A. The use of 2-chloroprocaine for spinal anaesthesia. *Acta Anaesthesiol Scand.* 2013;57:545-552.
13. Pollock JE.Intrathecal chloroprocaine-not yet "safe"by US FDA parameters.*Int Anesthesiol Clin*. 2012;50:93-100.
14. Kopacz DJ.Spinal 2-chloroprocaine:minimum effective dose.*Reg Anesth pain med.*2005;30:36-42.
15. Sell A,Tein T, Pitkanen M. Spinal 2-chloroprocaine:effective dose for ambulatory surgery. *Acta Anaesthesiol Scand.* 2008;52:695-699.
16. Casati A, Danelli G, Berti M, et al.Intrathecal 2-chloroprocaine for lower limb outpatient surgery: a prospective, randomized, double-blind, clinical evaluation. *Anesth Analg*. 2006;103:234-238,table of contents .
17. Ar Teunkens, Kristien Vermeulen, Elke Van Gerven, Steffen Fieuws, Marc Van de Velde, Steffen Rex. Comparison of 2-chloroprocaine, bupivacaine, and lidocaine for spinal anesthe in patients undergoing knee arthroscopy in an outpatient setting, A Double-Blind Randomized Controlled Trial. *Regional Anesthesia and Pain Medicine.* 2016;41:576- 583.
18. Casati A , Fanelli G, Danelli G, et al. spinal anesthesia with lidocaine or preservative free 2-chloroprocaine for out patient knee arthroscopy: a prospective, randomized, double-blind comparison. *Anesth Analg*. 2007;104:959-964.
19. Yoos JR, Kopacz DJ. Spinal 2-chloroprocaine: a comparison with small-dose bupivacaine in volunteers. Anesth Analg 2005; 100: 566-72
20. Hadzic A. Textbook of regional anesthesia and acute pain management. New York: McGraw Hill; 2007. p. 85
21. Breebaart MB, Vercauteren MP, Hoffmann VL, Adriaensen HA. Urinary bladder scanning after day-case arthroscopy under spina anaesthesia: comparison between lidocaine, ropivacaine, and levobupivacaine. Br J Anaesth 2003; 90: 309-13