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

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Abstract
Background: Aims of the study to compare 2-CP with bupivacaine for spinal anesthesia in an elective ambulatory setting.
Methods: Hospital based Randomized, Double Blind, Interventional study conducted on patients undergoing for ambulatory surgery under subarachnoid block.
Results: The finding that shows the most significant advantage is the time for regression of the sensory block to S2, as 2-CP was faster than bupivacaine.
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

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[1].

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.[2]

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 While 2-chloroprocaine was withdrawn from the market in the 1980s because of concerns about neurotoxicity,[9-10]a new formulation without preservatives that has no longer been associated with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) [3-4].

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[5].

Material and Method

Study area:

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

Study design:

Hospital based Randomized, Double Blind, Interventional study.

Study Group:

The study will be conducted in following two groups of patients. Each group was consist of 30 patients.

Group I – chloroprocaine group (n=30)

4ml of 1% chloroprocaine

Group II –bupivacaine group (n=30)

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.

Exclusion Criteria:

- o Patient Refusal
- o Patients with history of bleeding disorders or patients on

anticoagulants, Platelet<75,000.

o Chronic history of headache and backache or any Neurological disease.

o Severe hypovolemia, anemia, compromised renal, cardiac or respiratory status.

o Spinal deformity or infection at the local site.

o Patient allergic to Local Anaesthetic drug

o Failed spinal block

o Pregnant women.

Data Analysis:

Data was recorded as per Performa. The data analysis was computer based; SPSS-22 was used for analysis. For categoric variables chi-square test was used. For continuous variables independent samples's *t*-test was used. *p*-value <0.05 was considered as significant

Results

Table 1: Demographics profile

Variable	Group-I	Group-II	P-Value
Age in Yrs	51.36±6.12	52.31±7.15	>0.05
Sex (M:F)	21:9	22:8	>0.05

Both groups were comparable.

Table 2: Outcome

Variable	Group-I		Group-II		P-Value
	Mean	SD	Mean	SD	
Time to eligibility for discharge from hospital (min)	277.69	82.13	351.69	92.58	0.001
Time for two-segment regression (min)	49.68	18.25	71.52	37.69	0.001
Time for complete regression to S2 (min)	142.13	37.24	326.24	81.26	0.001
Duration of the motor block (min)	72.14	25.13	127.26	92.58	0.001
Time to ambulation (min)	221.36	36.24	268.92	44.28	0.001

Discussion

The finding that shows the most significant advantage is the time for regression of the sensory block to S2, as 2-CP was 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.[6] 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.[7]

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).[8]

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.

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