



COMPARISON OF 2-CHLOROPROCAINE VERSUS LIDOCAINE IN SELECTIVE SPINAL ANAESTHESIA IN PATIENTS UNDERGOING TRANSURETHRAL RESECTION OF PROSTATE SURGERIES

Anaesthesiology

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ABSTRACT

Background- The purpose of the study is to compare the two short acting local anaesthetics lidocaine and 2-chloroprocaine and fentanyl as adjuvant in both the groups in selective spinal anaesthesia in elderly patients undergoing transurethral prostate surgeries.

Methods- Hospital based Randomized double blind interventional study was conducted

Results- Visual analogue score among the two groups shows at different time intervals. The results were compared by Kruskal-Wallis H test. The difference in VAS scores were found to be NOT statistically significant different between two groups ($p>0.05$).

Conclusion- Selective spinal anaesthesia with both chloroprocaine and lidocaine achieved by mixing them with small doses of fentanyl provided satisfactory anaesthesia for transurethral resection of prostate surgery. Only modalities we desired for the surgery are blocked as we used selective spinal anaesthesia with very low doses of drugs. Both agents were comparable in terms of clinical end points of interest, recovery of sensory and motor block, as well as clinical anaesthesia conditions. In view of the incidence of TNS with lidocaine chloroprocaine can be a better alternative as it has no risk of TNS and provides comparable spinal block characteristics.

KEYWORDS

VAS, Lidocaine, Chloroprocaine.

INTRODUCTION

Pain, as defined by the International Association for the Study of Pain (IASP) is "an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage"¹.

The management of pain is major aspect of anaesthesia, should include pain management during the intra and post-operative period. Regional anaesthesia has many benefits over general anaesthesia. It eliminates the pain both intra-operatively as well as post-operatively, provides excellent muscle relaxation, reduces intra-operative bleeding and little CNS changes. Epidural and spinal blocks are the major techniques available in regional anaesthesia, with a long history of effective use for a variety of surgical procedures and pain relief. The incidence of post-operative deep vein thrombosis and pulmonary emboli is also less with spinal anaesthesia.

Spinal anaesthesia is frequently used mode of anaesthesia for transurethral prostatectomy (TURP)^{34,55}, as the signs and symptoms of water intoxication, fluid overload and bladder perforation can be recognized early because patient is awake³⁸. However, many patients undergoing anaesthesia for TURP are elderly³⁶ and have coexisting cardiac or pulmonary disease. It is important to limit the distribution of spinal block to reduce adverse haemodynamic and pulmonary effects in such patients. By using very small doses of local anaesthetic, one can limit the distribution of spinal block.

Low doses of local anaesthetics cannot provide an adequate level of sensory block. Intrathecal opioids enhance analgesia from subtherapeutic dose of local anaesthetic and make it possible to achieve successful spinal anaesthesia using otherwise inadequate doses of local anaesthetics^{32,58,59}. Various types of local anaesthetics could be used for regional anaesthesia like bupivacaine²⁰, levobupivacaine²¹, ropivacaine³⁵, lignocaine¹⁸.

Local anaesthetics have a limited duration of action and have adverse effects if we give in higher doses. So started using selective spinal anaesthesia^{33,40-43} by using minimal doses of local anaesthetics so that nerve roots supplying a specific area and only the modality that require is affected, so used adjuvants for denser blocks^{11,12}, faster onset and prolonging the duration of analgesia, while minimizing systemic adverse effects. Adjuvants like Fentanyl³⁵, Nelbupine⁴⁶, Clonidine⁴⁷, Neostygmine⁴⁸, midazolam⁴⁹, Dexamethasone⁵⁰, Ketamine⁵¹, Octreotide⁵², Calcitonin⁵³, Adenosine⁵⁴ etc have been studied as sole agent or in comparison with other adjuvants concomitantly with local anaesthetic solution.

Fentanyl is an opioid analgesic. It interacts predominantly with opioid mu-receptor but also binds to kappa and delta type of opioid receptors³⁷. Fentanyl exerts its principal pharmacologic effects on the central nervous system. Its analgesic and sedative properties were found when intrathecal, epidural or intravenous fentanyl were used as an adjuvant on previous studies^{45,58}.

The purpose of the study is to compare the two short acting local anaesthetics lidocaine and 2-chloroprocaine and fentanyl as adjuvant in both the groups in selective spinal anaesthesia in elderly patients undergoing transurethral prostate surgeries.

MATERIAL AND METHODS

Study Design:

Hospital based Randomized double blind interventional study.

Study Groups:

Study was conducted in the following two groups of patients. Each group consist of 40 patients (n = 40/group),

Group A -Lidocaine group (n=40) -35mg of Lidocaine + 12.5mcg fentanyl

Group B-Chloroprocaine group(n=40)-40mg of 2-chloroprocaine +12.5mcg fentanyl

Eligibility Criteria

Inclusion Criteria:

- Patients aged 50-70yrs.
- Patient height >145 cm.
- Patient's body weight 50-70 kg.
- ASA grade I-III.
- Undergoing TURP surgery

Exclusion Criteria:

- Patients who were not willing to participate in the study.
- History of chronic diseases like hypertension, diabetes mellitus, respiratory disease, epilepsy, cardiac disease, spinal disorders.
- Chronic history of headache and backache, infection in the back.
- Any absolute or relative contraindication to study drugs.
- Uncooperative patients.
- Failure of spinal anaesthesia, cases in which general anaesthesia required.

OBSERVATIONS

The mean age of individual in group A was 65.35±7.16 years. The mean age of individual in group B was 63.23±8.63 years. The mean

weight of individual in group A was 62.38±5.34 kgs

Table 1. Distribution Of Sensory Level

	Group A		Group B		P value
	Mean	SD	Mean	SD	
Time to reach T10	5.55	2.91	4.68	2.66	0.164 (NS)
Time to reach L3	2.90	1.46	2.55	1.36	0.271 (NS)
Time to reach maximum Level	20.50	3.89	18.88	4.92	0.141 (NS)
Duration of sensory block above T10	62.63	18.57	55.88	18.60	0.108 (NS)
Time to regress to L1	72	10.3	68.62	10.13	0.144(NS)
Duration of sensory block above L3	93.38	27.49	103.50	38.40	0.179 (NS)
Time for sensory level to regress to S4	161.3	10.3	158.2	9.56	0.067(NS)

In Group A, the time to reach T10 sensory block level was 5.55±2.91minutes.

The time to reach L3 level of sensory block level was 2.90 ± 1.46minutes.

The time to reach maximum Level of block was 20.50 ± 3.89 minutes.

In Group B, the time to reach T10 sensory block level was 4.68±2.66 minutes.

The time to reach L3 level of sensory block level was 2.55 ± 1.36minutes.

The time to reach maximum Level of block was 18.88 ± 4.92 minutes.

There was no statistically significant difference between the two groups (p>0.05).

In Group A, the duration of sensory block above T10 was 62.63±18.57minutes.

In Group B, the duration of sensory block above T10 was 55.88±18.60 minutes.

The results were comparable among the two groups (p>0.05).

In Group A, the mean time to regress to L1 was 72±10.3 minutes.

In Group B, the mean time to regress to L1 was 68.62±10.13 minutes.

The results were comparable among the groups (p>0.05).

In Group A, the duration of sensory block above L3 was 93.38±27.49 minutes.

In Group B, the duration of sensory block above L3 was 103.50±38.40 minutes.

The results were comparable among the groups (p>0.05).

In Group A, the time for sensory level to regress to S4 was 161.3±10.3 minutes.

In Group B, the time for sensory level to regress to S4 was 158.2±9.56 minutes.

The results were comparable among the groups(p>0.05).

Table 2. 24 Hour Analgesic Consumption

	Group A		Group B		P value
	Mean	SD	Mean	SD	
24 hr analgesic consumption	136.87	60.97	144.38	78.55	0.634 (NS)

In Group A, the 24 hour analgesic consumption was 136.87±60.97 minutes.

In Group B, the 24 hour analgesic consumption was 144.38±78.55 minutes.

The results were comparable among the two groups (p>0.05).

Table 3. Motor Power By Modified Bromage Scale

	Group A		Group B		P value
	Mean	SD	Mean	SD	
Pre-operative	3	0.00	3	0.00	NS
End of surgery	3	0.00	3	0.00	NS
1 h	2	0.00	2	0.00	NS
2 h	0	0.00	0	0.00	NS

In Group A, the median of Bromage score(n) at pre-operatively, end of surgery, 1 hr, 2 hr was 3,3, 2 and 0 respectively.

In Group B, the median Bromage score(n) at pre-operatively, end of surgery, 1 hr, 2 hr was 3, 3, 2 and 0 respectively.

Application of Chi-square test showed that this difference was statistically insignificant among all groups.

Table 4. VAS Score Among The Groups

	Group A		Group B		P value
	Mean	SD	Mean	SD	
1h	0.00	0.00	0.00	0.00	-
2 h	0.00	0.00	0.00	0.00	-
3 h	0.00	0.00	0.00	0.00	-
4 h	0.43	0.75	0.30	0.61	0.414 (NS)
5 h	2.18	0.90	1.98	0.81	0.061 (NS)
6 h	2.85	0.86	2.60	0.81	0.072 (NS)
7 h	3.85	0.92	3.68	0.83	0.374 (NS)
8 h	4.23	0.49	4.13	0.72	0.065 (NS)
12 h	4.68	0.47	4.55	0.50	0.256 (NS)
16 h	4.68	0.47	4.55	0.50	0.256 (NS)
20 h	4.68	0.47	4.55	0.50	0.256 (NS)
24 h	4.68	0.47	4.55	0.50	P<0.256 (NS)

DISCUSSION

Group A had the highest level of sensory block of T8.

Group B had the highest level of sensory block of T9.

There is no significant difference among the groups.

The result of this study was comparable with those Casati A, Fanelli G, Danelli G et al⁶. They concluded spinal anaesthesia with 50 mg of 1% preservative-free 2-chloroprocaine provided a faster resolution of spinal block than the same dose of 1% plain lidocaine, showing T10 in lidocaine group and T9 in chloroprocaine group. One dermatome higher level of sensory block may be due to higher dose used to perform spinal anaesthesia.

Also compared with Kouri M, Kopacz D⁷ administered 40 mg 2% lidocaine in one group and 40 mg 2% preservative-free 2-chloroprocaine in second group and concluded that Chloroprocaine produced anaesthetic efficacy similar to lidocaine, including peak block height.

Mean time to reach highest sensory level in group A: 20.50±3.89

Mean time to reach highest sensory level in group B: 18.88±4.92

As the p>0.05, The differences among the groups were found to be statistically not significant.

Our results are comparable with the study conducted by H. Vaghadia. G. Neilson et al⁸ showing the comparable results.

VAS scores were monitored hourly upto 8 hour postoperative then 4 hourly for 24 hours. Analysis with Kruskal-wallis H test and Mann-whitney U test revealed that VAS scores were comparable in Group A and group B (p>0.05). This was in accordance with study conducted by H. Vaghadia, G. Neilson and P. H. Lennox et al⁹.

CONCLUSION

Selective spinal anaesthesia with both chloroprocaine and lidocaine achieved by mixing them with small doses of fentanyl provided satisfactory anaesthesia for transurethral resection of prostate surgery. Only modalities we desired for the surgery are blocked as we used selective spinal anaesthesia with very low doses of drugs. Both agents were comparable in terms of clinical end points of interest, recovery of sensory and motor block, as well as clinical anaesthesia conditions. In

view of the incidence of TNS with lidocaine chloroprocaine can be a better alternative as it has no risk of TNS and provides comparable spinal block characteristics.

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