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Anaesthesiology

USE OF 2 CHLORPROCAINE WITH OR WITHOUT FENTANYL IN DAY CARE SURGERIES

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ABSTRACT **Introduction -**2chlorprocaine is a local anesthetic drug with very short half life and is very favorable for day care surgeries with addition of fentanyl or without fentanyl. It had less complications and above all fast recovery so reducing hospital stay.

Methods and materials – patients between 18 to 60 years of age of either sex scheduled at Dr D Y Patil Medical College Pimpri pune given 2-chlorprocaine and 2-chlorprocaine with fentanyl.

Result: Chlorprocaine was used as spinal anaesthesia drug as alternative to bupivacaine for day care lower limb surgeries. We tested chlorprocaine as spinal anaesthesia drug in 60 patients with and without fentanyl a prospective study. Spinal anaesthesia was successful for all the patients with complete block regression , ambulation and voiding in all patients within 130 minutes maximum.

The main aim is to use drug for day care surgeries in lower limbs the complete regression of block in fentanyl group is 108.97±8.73 and without fentanyl is 99.0±7.77 and voiding is with fentanyl is 96.73±9.27 and without fentanyl is 94.03±8.15. Neither patient shown transient neurological symptoms nor hemodynamic complications.so we concluded that 2 chlorprocaine provides rapid onset and adequate potency giving surgeon complete blockade with early ambulation and minimum rescue analgesia needed with addition of fentanyl so it becomes preferable drug in day care lower limb surgeries.

KEYWORDS :

INTRODUCTION

Spinal anesthesia is safe and reliable technique for surgeries of lower abdomen and short surgical procedures but there are some limitations for spinal anesthesia including delayed ambulation, risk of urinary retention, and pain after block regression. Therefore choice of correct local anesthetic for spinal anesthesia is crucial in ambulatory settings. The choice of correct anesthetic should allow rapid onset and short duration of action.

Although low doses of long acting local anesthetics such as bupivacaine , ropivacaine , and levobupivacaine are usually used intrathecally they are associated with significant risk of delays in hospital discharge and less reliability of block efficacy onset and spread . Short acting local anesthetics may therefore present a valid alternative. Lidocaine has been anesthetic of choice for years in the context of outpatients procedures but associated with significant risk of transient neurological symptoms(TNS) so most anesthetists skip its use. Sodium bisulphite was then added as preservative in 1956.Transient neurological deficit was seen due to Sodium bisulphite. Accidental high doses of CP during epidural labour analgesia.It was abandoned because of TNS.Now preservative free CP is available. Mepivaicaine has been associated with TNS . The recent re-introduction of intrathecal cholrprocaine may offer solution in the ambulatory setting with a slightly faster profile for CP.

2-CP is available as a 10mg/ml solution which is approved by the Astra pharmaceutics , Wilmington, DE , USA is preservatives free . Previously sodium bisulfite used as preservative was responsible for neurological complications . Postoperative pain and urinary retention were the main reasons for delayed discharge from hospital in the study by yoos and kopacz. With 2-CP Urinary retention absent and wearing of block faster. Cardiac arrest with bupivacaine is more difficult to revert.

Pharmacology: 2 Chloroprocaine is ester type of local anesthetic. It is rapidly metabolized in plasma by hydrolysis of ester linkage by pseudocholineestrase . Elimination of chloroprocaine from csf entirely by diffusion. Plasma half life is 21+2 seconds for males and 25+1seconds for females. 2CP is isobaric product that is its specific gravity is same as that of csf. Rate of absorption is higher and rate of metabolism is also faster . Very low maternal to fetal plasma levels probably insignificant to mother and fetus with normal plasma choline esterase activity.

Fentanyl is chemically related to meperidine. Meperidine is first completely synthetic opioid and can be regarded as the prototype clinical phenylperidine . These are highly soluble weak bases that are highly protein bound and largely ionized at physiologic pH. 84% bound to plasma protein. 1.5% diffusible fraction. It acts on Mu (μ) receptors. It has spinal analgesia as well as supraspinal analgesia.it has ventilator depression , sedation. It will cause bradycardia , decreased preload and afterload and increased vagal tone in brain stem. It will cause nausea, vomiting as it stimulates chemoreceptor trigger zone in the area postrema on the floor of fourth ventricle in the brain.

MATERIALS AND METHODS

Type of study:- Prospective Observational Study
Period of Study:- July 2018 to Jan 2019.
Period required for data collection:-6months
Period required for data analysis and reporting:-6 months

Sample Size:-
1. 2 chlorprocaine 40 mg (n=30)
2. 2 chlorprocaine 40mg with 20 mcg fentanyl (n=30)

Study group:- Patients between 18 to 60 years of age of either sex scheduled, at Dr D Y Patil Medical College, Pimpri ,Pune

Place of study:- Department of Anaesthesiology and Critical Care Dr D.Y Patil Medical College, Hospital& Research centre.

Pimpri,Pune 411018.

No extra expenditure from patients .

Budget And Funding: The study will be self funded and disposables and other necessary drug supply will be from the central pharmacy.

OBSERVATIONS AND RESULTS

Comparison of Onset of sensory block with and without fentanyl

Group	Mean ± SD	t Value	Mean Difference	95% Confidence Interval of the Difference		P Value
				Lower	Upper	
With fentanyl	5.40 ± 1.33	6.008	2.00	1.33	2.67	<0.001
Without fentanyl	3.40 ± 1.25					

Comparison of Onset of motor block with and without fentanyl

Group	Mean ± SD	t Value	Mean Difference	95% Confidence Interval of the Difference		P Value
				Lower	Upper	
With fentanyl	7.10 ± 1.24	6.720	2.13	1.50	2.77	<0.001
Without fentanyl	4.97 ± 1.22					

Comparison of Offset of sensory block with and without fentanyl

Group	Mean ± SD	t Value	Mean Difference	95% Confidence Interval of the Difference		P Value
				Lower	Upper	
With fentanyl	74.97 ± 6.17	4.137	6.30	3.25	9.35	<0.001
Without fentanyl	68.66 ± 5.61					

Comparison of Offset of motor block with and without fentanyl

Group	Mean ± SD	t Value	Mean Difference	95% Confidence Interval of the Difference		P Value
				Lower	Upper	
With fentanyl	83.40 ± 7.30	3.172	6.40	2.36	10.44	.002
Without fentanyl	77.00 ± 8.29					

Comparison of Two point regression in block with and without fentanyl

Group	Mean ± SD	t Value	Mean Difference	95% Confidence Interval of the Difference		P Value
				Lower	Upper	
With fentanyl	77.07 ± 8.26	-3.590	-8.10	-12.62	-3.58	.001
Without fentanyl	85.17 ± 9.19					

Comparison of Duration of anesthesia with and without fentanyl

Group	Mean ± SD	t Value	Mean Difference	95% Confidence Interval of the Difference		P Value
				Lower	Upper	
With fentanyl	108.97 ± 8.73	4.670	9.97	5.69	14.24	<0.001
Without fentanyl	99.00 ± 7.77					

Comparison of Time to ambulate with and without fentanyl

Group	Mean ± SD	t Value	Mean Difference	95% Confidence Interval of the Difference		P Value
				Lower	Upper	
With fentanyl	108.97 ± 8.73	4.670	9.97	5.69	14.24	<0.001
Without fentanyl	99.00 ± 7.77					

Comparison of Time to void with and without fentanyl

Group	Mean ± SD	t Value	Mean Difference	95% Confidence Interval of the Difference		P Value
				Lower	Upper	
With fentanyl	96.73 ± 9.27	1.198	2.70	-1.81	7.21	.236
Without fentanyl	94.03 ± 8.15					

- **Comparison of Onset of sensory block with and without fentanyl**

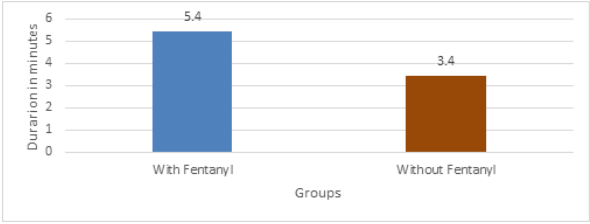

Table 1: Onset of sensory block was found to be highly statistically significantly faster with fentanyl as compared to anesthetic without fentanyl i.e. 5.40 ± 1.33 minutes as compared to 3.40 ± 1.25 minutes (P=<0.001).

- **Comparison of Duration of anesthesia with and without fentanyl.**

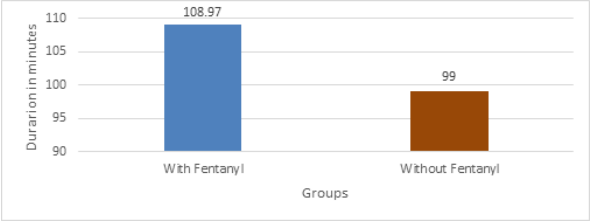

Table 2: Duration of anesthesia was found to be highly statistically significantly longer with fentanyl as compared to anesthetic without fentanyl i.e. 108.97 ± 8.73 minutes as compared to 99.00 ± 7.77 minutes (<0.001)

Comparison of Time to ambulate with and without fentanyl

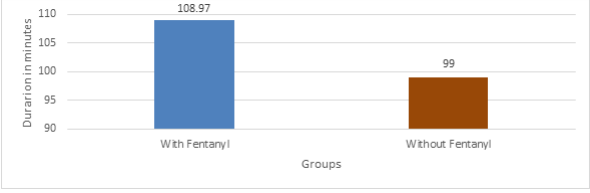

Table 3: Time to ambulate was found to be highly statistically longer with fentanyl as compared to anaesthetic without fentanyl i.e. 108.97 ± 8.73 minutes as compared to 99.00 ± 7.77 minutes (<0.001).

- **Comparison of Time to void with and without fentanyl**

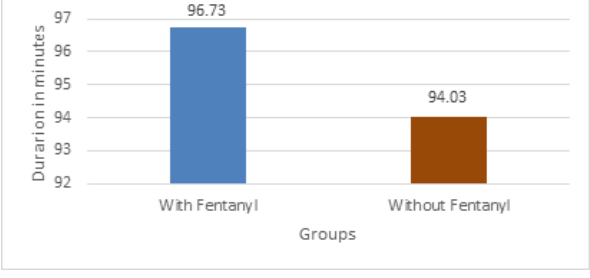

Table 4: Time to void was found to be statistically non-significant highly statistically between both the groups i.e. with fentanyl as compared to anesthetic without fentanyl (96.73 ± 9.27minutes as compared to 94.03 ± 8.15 minutes (<0.001).

Rescue analgesia was needed in 60% of patients with 2chlorprocaine and needed in 3% patients with 2 chlorprocaine with fentanyl.

No significance difference in hemodynamic stability was seen in both the groups.

No significant changes seen in ECG, SPO2 .

DISCUSSION :

The main finding of this study is that addition of 20 mcg of fentanyl with 2 chlorprocaine will prolongs sensory blockade by almost 5 minutes and motor blockade by almost 8 minutes. The delay for discharge is eventually of 8 minutes with fentanyl group and all patients were ambulated within almost 120 minutes that is almost 2 houres.

	With Fentanyl	Without Fentanyl	P value
Onset of sensory	5.40±1.33	3.40±1.25	<0.001
Onset of motor	7.10±1.24	4.97±1.22	<0.001
Offset of sensory	74.97±6.17	68.66±5.61	<0.001
Offset of motor	83.40±7.30	77.00±8.29	0.002
Two point regression in block	77.07±8.26	85.17±9.19	0.001
Duration of anesthesia	108.97±8.73	99.00±7.77	<0.001
Time to ambulate	108.97±8.73	99.00±7.77	<0.001
Time to void	96.73±9.27	94.03±8.15	0.236

In conclusion , we found that 2 chlorprocaine has fast onset of action , predictable duration to ambulate the patient and adequate potency without any transient neurological complications and hemodynamic complications as the initial study is quite small further large scale will be necessary to insure safety of patients. The addition of fentanyl will significantly minimally increase sensory and motor blockade but patients were ambulated , voided and discharged from hospital in day without any other complications. This makes chlorprocaine with fentanyl an attractive choice for day care surgeries.

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