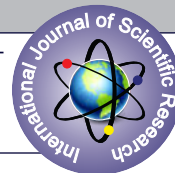


# AN OBSERVATIONAL STUDY OF EFFECTIVENESS OF 2ml 0.5% LEVOBUPIVACAINE + 0.5ml (25mcg) FENTANYL COMBINATION IN SPINAL ANAESTHESIA FOR TRANSURETHRAL RESECTION OF PROSTATE (TURP)/ TRANSURETHRAL RESECTION OF BLADDER TUMOUR (TUR-BT)



## Anesthesiology

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## ABSTRACT

**Background And Aims:** Elderly age and circulatory overload due to absorption of irrigating fluid are two main challenges in patients posted for TURP/TUR-BT. So, we decided to evaluate the effectiveness of low dose levobupivacaine (less cardiotoxic) with fentanyl in spinal anaesthesia for TURP patients. **Methodology:** This prospective observational study was done in 60 patients scheduled for TURP / TUR-BT and receiving 2ml (0.5%) isobaric levobupivacaine + 0.5ml (25mcg) fentanyl in spinal anaesthesia after getting approval from ethical committee. Heart rate, systolic blood pressure, diastolic blood pressure was recorded at regular interval. Sensory level was assessed by pinprick and motor level by modified bromage scale. Time of onset of sensory and motor block level, peak sensory and motor block, time for regression of motor and sensory block was recorded. **Result:** Success rate with levobupivacaine was 95%. All patients achieved T10 level within mean time of 3.89 min  $\pm$  1.7 and motor grade 3 within mean time of 4.45 min  $\pm$  3.18. Total time for regression of sensory block was 160 min  $\pm$  16.4 and motor block was 159.1 min  $\pm$  15. There was statistically significant difference in heart rate and mean arterial blood pressure compared to baseline, but it was clinically within 15% from baseline. **Conclusion:** Levobupivacaine in low dose with fentanyl in spinal anaesthesia can be a good choice in elderly patients posted for TURP/TUR-BT in terms of adequate sensory and motor block, clinically stable haemodynamic parameters and minimal side effects.

## KEYWORDS

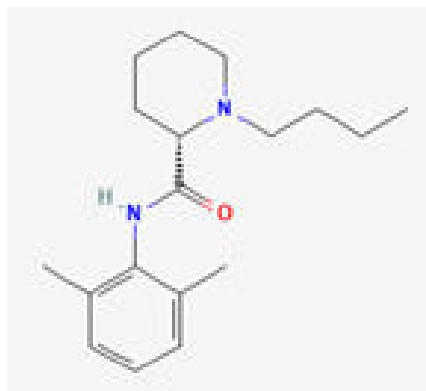
Elderly, TURP, levobupivacaine.

## INTRODUCTION

Regional anesthesia has emerged as an important technique, with simplicity, rapid onset of action and good muscle relaxation. Intrathecal anesthesia is a widely used regional anesthesia technique, providing effective sensory and motor blockade.

Racemic bupivacaine is the most frequently used long-acting agent for intrathecal anesthesia. But it also carries undesirable effects like cardiotoxicity and CNS toxicity. In recent years levobupivacaine, the pure S (-) stereoisomer of bupivacaine, emerged as a safer alternative for regional anesthesia than its racemic parent due to its low cardio toxicity and less undesired effects on the central nervous system than bupivacaine.

Neuraxial opioids are widely used in conjunction with local anesthetics as they permit the use of lower dose of local anesthetics, while providing adequate anesthesia and analgesia. Neuraxial opioids also allow prolonged analgesia in the post operative period and faster recovery from spinal anesthesia. Fentanyl a lipophilic opioid has been used commonly with bupivacaine, for enhancement of analgesia without intensifying motor and sympathetic block in intrathecal analgesia. TURP is the most common surgical intervention for patient with BPH. Excessive absorption of irrigation fluid and lithotomy position increases the chances of circulatory overload. Elderly age and associated cardiovascular co-morbidity may add to it.



**Figure 1:** Structure of levobupivacaine

Spinal anesthesia is the technique of choice for TURP (Transurethral Resection of Prostate) and TUR-BT (Transurethral Resection of bladder tumor) Spinal anesthesia helps for peripheral pooling of blood and decreases circulatory overload and also early detection of

condition like TURP (Transurethral Resection of Prostate) syndrome, bladder perforation etc. Added advantage of post operative analgesia, decreased blood loss and avoidance of tracheal intubation. In our institute no other study on levobupivacaine in spinal anesthesia has been done. So, we decided to evaluate the effectiveness of this cardio stable drug levobupivacaine in low dose of 2ml with 25 mcg of fentanyl in spinal anesthesia for TURP and TURBT in terms of sensory and motor block characteristics, hemodynamic stability and side effects, if any.

Proper name: Levobupivacaine hydrochloride Chemical name: (S)- 1- Butyl- 2', 6'- pipercoloxylidide IUPAC name: (S)- 1- butyl- N- (2, 6-dimethylphenyl) piperidine- 2- carboxamide Molecular formula: C<sub>18</sub>H<sub>28</sub>N<sub>2</sub>O Molecular mass: 288.43 g/mole

## AIM:

To evaluate the effectiveness of 2ml 0.5% levobupivacaine + 0.5ml (25mcg) fentanyl combination in spinal anesthesia for Transurethral resection of prostate (TURP)/ Transurethral resection of bladder tumor (TUR-BT)

## Primary Objective:

To study the onset and duration of sensory and motor block

## MATERIALANDMETHODOLOGY:

After obtaining approval from institution ethical committee (GMC,surat), prospective observational study was conducted on 60 patients posted for Transurethral resection of prostate (TURP)/ Transurethral urethral resection of bladder tumor (TUR-BT)

## Inclusion Criteria:

Patients giving consent for participation in the study.

## Exclusion Criteria:

1. Any contraindication to spinal anesthesia (coagulopathy, localized infection and neurological diseases).
2. Allergy to local anesthetic agents.

Patient's pre anesthetic check-up was done a day before surgery. The procedure to be done was explained to relatives and the patient himself and informed written consent was taken.

On the day of surgery, in the preoperative room, baseline vital parameters were recorded. I.V. line was secured. After taking patient inside operation theatre, pulse oximetry, NIBP and ECG monitors were attached, and baseline vitals were recorded. Spinal anesthesia

was given in a sitting position under all aseptic and antiseptic precautions in L2-L3/ L3-L4 space with 25 G spinal needle using inj. Isobaric Levobupivacaine (0.5%) 2ml + fentanyl (25mcg) 0.5mlm. Patient was made supine after 2 minutes after spinal injection. HR, SBP, DBP, SpO2 were recorded at regular interval after spinal block. Sensory blockade was assessed by pinprick method and motor blockade was assessed by Modified Bromage scale.

Sensory and motor effect were checked every 2 minutes up to 30 minutes. If sensory level T10 was not achieved in 15 minutes of giving spinal anesthesia, it was considered as a failed case and patient was given general anesthesia. If sensory level of T10 achieved and patient complains of plain / discomfort, then inj Fentanyl 1 microgram/kg was given and it could be repeated after 10 minutes. After 2nd dose of fentanyl if patient complained same then general anesthesia was given and it was considered as a failed case.

In post-operative period patient will be monitored by post graduate resident for hemodynamic parameters, regression of sensory and motor block and analgesia. For analgesia, we will use VAS score every 30 minutes till 2hours then every 15 minutes till VAS>3 when rescue analgesic in form of Inj.Diclofenac sodium 75mg/ Inj. Paracetamol as per surgeon's choice will be given. Patients will also be monitored for any side effects like hypotension, bradycardia, nausea, vomiting, sedation, pruritis, headache, backache and any neurological changes.

Statistical Analysis

The data collected during time period of May 2020 to May 2021 was entered into a database Microsoft excel sheet.

The results were expressed as mean ± standard deviation.

The statistical analysis was done using Microsoft excel using the unpaired student t test.

The difference was considered to be statistically significant when P value<0.05 and highly significant when p value.

RESULTS

The present study was conducted on 60 male patients who were scheduled for TURP/TUR-BT at tertiary care Centre during.

We observed 60 patients out of them 3 patients had no effect of drug when given in spinal anesthesia and general anesthesia according to our institution protocol was given to them. So, we considered observational data of 57 patients in our study.

Table 1: Demographic Data

| PARAMETERS  | N=57 MEAN±SD |
|-------------|--------------|
| AGE(YEARS)  | 59.9 ± 13.9  |
| WEIGHT(KGS) | 62.7 ± 8.0   |

N= Number of patients

Out of total 57 patients posted for TURP/TUR-BT, majority of our patients belonged to male gender that is 93%, and rest were female that is 7%.  
Out of total 57 patients posted for surgery, 86% of the patients were posted for TURP, 14% of the patients were posted for TUR-BT procedure.

Table 2: Comorbidity Distribution

| Comorbidity | Number(n=57) | Percentage |
|-------------|--------------|------------|
| DM          | 3            | 5.3%       |
| HTN         | 13           | 21.1%      |
| Absent      | 42           | 73.7%      |

DM=Diabetes Mellitus, HTN=Hypertension, n=Number of patients

Table 3: Characteristics Of Sensory Block

| CHARACTERISTICS OF SENSORY BLOCK      | GROUP (N=57) MEAN±SD |
|---------------------------------------|----------------------|
| Time to achieve T10 Level             | 3.89 min ± 1.7       |
| Highest sensory level achieved at T10 | 10 patient.          |

|                                              |                  |
|----------------------------------------------|------------------|
| T4                                           | 3 patient        |
| T6                                           | 31 patient       |
| T8                                           | 13 patient       |
| Time to achieve highest sensory Level        | 6.25 min ± 3.6   |
| Time to regression to L1 Level               | 115.8 min ± 20.0 |
| Time to complete regression of sensory block | 160 min ± 16.4   |
| Duration of sensory block                    | 156.4 min ± 16.9 |

N=Number Of Patients

Table 4: Characteristics Of Motor Block

| CHARACTERISTICS OF MOTOR BLOCK              | GROUP (N=57) MEAN±SD (minutes) |
|---------------------------------------------|--------------------------------|
| Time to achieve bromage grade 1 (min)       | 2.28 min± 0.79                 |
| Highest bromage grade achieved              | 3                              |
| Time to achieve highest bromage grade (min) | 4.5min ±3.2                    |
| Total duration of motor block               | 155 min ± 15.6                 |
| Time to complete regression of motor block  | 159.1 min ± 15.0               |

N=number of patients

HAEMODYNAMIC PARAMETERS

HEART RATE

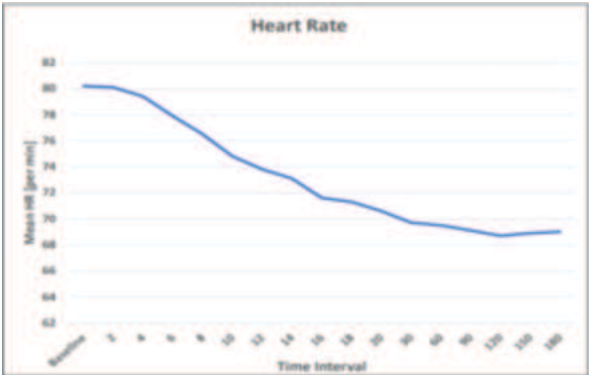


Figure 2: Mean Heart Rate At Various Time Interval

Mean of heart rate at baseline was 81.2±10.4 per minute and at 150 minutes it was 68.9±10.5 with p value<0.05. We observed statistically significant difference of Mean heart rate at 2, 6, 8, 10, 12, 14, 16, 18, 20, 30, 60, 90, 120, 150, minutes after giving Spinal anesthesia, but clinically it was not significant. As it was within 20% from the baseline.

Mean Arterial Pressure

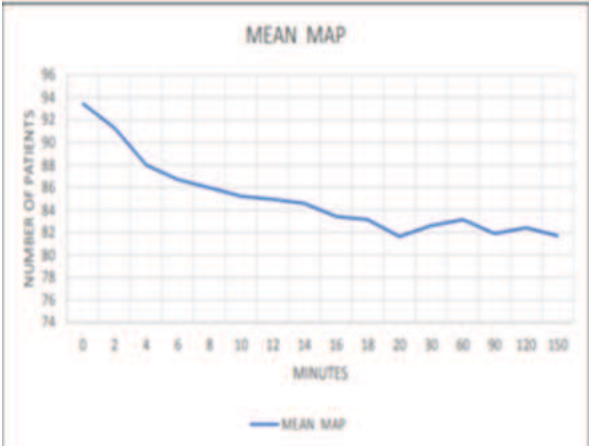


Figure 3: Mean Map At Various Time Intervals

Mean of mean arterial pressure at baseline and 150 minutes was  $90.88 \pm 7.61$  mm of Hg and  $81.71 \pm 8.87$  mm of Hg with p value  $< 0.05$ . So, mean arterial pressure in our study showed statistically significant difference at 4, 6, 8, 10, 12, 14, 16, 18, 20, 30, 60, 90, 120, 150 minutes when compared to baseline but clinically it was not significant as within 20% of baseline.

### Post Operative Side Effects

**Table 5: Post Operative Side Effects**

| Side effect     | Number (n=57) | %    |
|-----------------|---------------|------|
| Nausea          | 1             | 1.8  |
| Hypotension     | 6             | 10.5 |
| No side effects | 50            | 87.7 |

n= Number of patients

Nausea and hypotension were noted in 1.8% & 10.5% participants respectively. Nausea was treated with inj.ondansetron 4mg iv. Hypotension was treated with crystalloids iv and did not require any additional treatment.

### Strength And Limitations

#### Strength Of The Study

- Levobupivacaine is less cardiovascular and central nervous system toxic and has faster onset with effective sensory and motor block.
- Levobupivacaine has good hemodynamic stability.
- All the readings were taken by single observer, to decrease inter observer bias.
- Addition of fentanyl decreased the dose the levobupivacaine and adds to the hemodynamic stability of the patient.

#### LIMITATIONS

- Major limitation of study was that we have not followed up patients after discharge.
- Study was done in small sample size. So, the result of this study may not be applicable to large populations. We recommend a larger sample size.
- In the study only effectiveness of 10 mg levobupivacaine was observed so we cannot comment on different doses of levobupivacaine.
- The study was conducted on only TURP/TUR-BT surgery, so further studies should be conducted on other surgeries.

#### IMPLICATIONS

Levobupivacaine in spinal anesthesia can be used for infra umbilical surgeries like TURP/TUR-BT, knee arthroscopy, TVH surgery, hemorrhoidectomy, cervical polypectomy, etc.

It is a very useful alternative to bupivacaine for elderly patients and patients with mild to moderate cardiac abnormalities.

#### CONCLUSION

From our study Thus it can be inferred that levobupivacaine in low dose with fentanyl in spinal anesthesia can be a good choice in elderly patients posted for TURP/TUR-BT in terms of adequate sensory and motor block, clinically stable haemodynamic parameters and minimal side effects.

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