

## COMPARATIVE STUDY OF 0.5% LEVO-BUPIVACAINE (1ML) AND 0.5% BUPIVACAINE (1ML) IN SUB ARACHNOID BLOCK FOR DAYCARE TUBECTOMY SURGICAL PROCEDURES- A PILOT STUDY

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### Abstract

**Background:** To compare the efficacy and duration of sensory & motor block with Levo-bupivacaine 5mg & Bupivacaine 5mg in subarachnoid block for tubectomy. To compare the hemodynamic effects of Levo-Bupivacaine and Bupivacaine at a dose of 5mg for day care tubectomy procedures. **Materials and Methods:** A pilot study was conducted taking 100 females who are willing to undergo Tubectomy in the age group of 21 to 45 years. They were allocated to Group L and Group B with each having 50 individuals. Group B received 0.5% Hyperbaric Bupivacaine 5mg (1 ml) and Group L received 0.5% Hyperbaric Levo-Bupivacaine 5mg(1ml). Both groups were compared for duration of analgesia, sensory and motor block. Hemodynamic changes were monitored and compared in both groups. Data entered in MS excel and analysed by using SPSS software. Chi-square test was used to know the statistical significance between qualitative variables. **Result:** There is significant difference in Sensory blockade and Motor blockade with advantage to Levo- Bupivacaine in clinical as well as Statistical methods. **Conclusion:** Regional anesthesia is safe for Daycare Surgical procedure like Tubectomy, which is widely accepted method of sterilization method in Our Country. The widely used regional anesthetics agents, used for Daycare Tubectomy procedure are Levo-Bupivacaine and Bupivacaine. Levo-Bupivacaine has better Sensory and Motor blockade with less hemodynamic changes during the procedure time compared to Bupivacaine.

## INTRODUCTION

Female sterilisation has been the mostly used method of contraception worldwide. Several techniques are available that provide permanent contraception for female patients. The most common being disrupting the patency of the fallopian tubes. It may be performed immediately after child birth [post-partum] or at a time unrelated to pregnancy called Interval Tubectomy, which is mostly carried out as an outpatient procedure.<sup>[1]</sup> An interval tubal ligation can be done with a Laparoscopy or by using a small incision under the name called Mini-Laparotomy. Family planning has been a key priority programme of the Indian Government and it has been vigorously pursued through the national rural health mission launched in the year 2005. Since ours is a government hospital,

all tubectomies done in our centre are covered under National Family Planning Programme and mostly done by Mini-Laparotomy as a day care procedure. Spinal Anaesthesia was preferred as it has rapid recovery with usage of minimal drugs.<sup>[2]</sup> It also provides excellent analgesia and good operative conditions for surgeons and prevents intra-operative and post-operative complications, like Post-Operative Nausea and Vomiting (PONV).<sup>[3]</sup> There is unlikely need for airway instrumentation thus lowering the risk of airway complications. There is no delay in cognitive awareness which can hinder the care of the baby. The only drawback is occasional protracted block resolution as we lack short acting spinal agents without the risk of transient neurologic symptoms [TNS].<sup>[4]</sup> This can delay discharge from PACU. To avoid this, we used a very low dosage, 5mg of LEVO-bupivacaine, so

that normal activities can be resumed within 3 to 4 hours.

### Aims & Objectives

To compare the efficacy and duration of sensory & motor block with intrathecal bupivacaine 5mg & Levo-bupivacaine 5mg for tubectomy. To compare the hemodynamic effects of bupivacaine and Levo-bupivacaine at a dose of 5mg for day care tubectomy procedures.<sup>[5,6]</sup>

## MATERIALS AND METHODS

After obtaining ethics committee approval, this study was conducted in Government Victoria Hospital for women & children, Visakhapatnam with a sample size of 100 patients.

### Inclusion Criteria

ASA Grade I & Grade 2

Age between 21 & 45yr.

Morbid obese and previous abdominal surgeries.

### Exclusion Criteria

ASA Grade 3 & Grade 4

Age less than 21yrs and greater than 45yr.

1. The patients are randomly allocated into two groups, Group L & Group B of 50 each.
2. 50 patients in Group L received 5mg of 0.5% Levo-Bupivacaine and 50 patients in Group B received 5mg of 0.5% hyperbaric Bupivacaine.

### Procedure

All the women posted for Tubectomy procedure were asked to reach the operation theatre before the scheduled time of surgery with overnight fasting. Clear liquids were allowed till 2hrs before surgery. Patients were asked to take 2 tablets of Dulcolax, the night before surgery. In the pre-operative period, an intravenous line was secured with 20 Gauge IV canula and 500 ml of crystalloid was administered as pre-loading volume. Inj. Ondansetron, Inj. Pantoprazole and Antibiotics were given to both the groups.

In the operation theatre, standard monitors like 3 lead ECG, Pulse oximeter, non-invasive blood pressure were attached and baseline measurements were noted.

Under strict aseptic techniques, in lateral position, Lumbar puncture was done at L2-L3 intervertebral space by midline approach using 27G Quincke spinal needle. Sub arachnoid space was identified by clear flow of CSF.

For Group L, 5mg of L-Bupivacaine (Heavy) was given slowly at the rate of 0.5ml/sec.

For Group B, 5mg of 0.5% hyperbaric Bupivacaine was given slowly at the rate of 0.5ml/sec.

After completion, patient was turned supine and vitals monitored before the start of the procedure and after every 5 mins.

The sensory level was assessed by failure to perceive pin prick sensation till the desired level of T8 was achieved. The sensory block duration was recorded from the onset till sensation at the level of S2.

The duration of motor block was recorded at the time to achieve BROMAGE SCORE of  $\geq 2$  to time to complete recovery & motor power.

Hemodynamic parameters of all the patients were noted intraoperatively and post operatively upto 2 hrs. Adverse events were also noted. The primary objective of the study was to compare the duration of analgesia, sensory block in both groups & duration of motor block in both groups. The secondary outcome is to compare hemodynamic parameters.

### Sample Size Calculation

Total Sample taken was: 100

As there were no previous studies, we conducted Pilot study and took p value as 50%

By taking the formula  $4pq/I^2$

Where  $p = 50\%$

$q = 50$

$I = 10$

By substituting we get a sample size of 100.

### Statistical Analysis

Data entered in MS excel and analysed by using SPSS software. Qualitative data was represented as frequencies or percentages and quantitative data was represented as means and standard deviation. Chi-square test was used to know the statistical significance between qualitative variables. Unpaired t test was used to know the statistical significance between quantitative variables. P value  $< 0.05$  was considered as statistically significant.

## RESULTS

The Mean duration of Sensory block in Group L cases is 36.36 Min. compared to that of Group B is 46.76 Min. with S.D of 2.62 and 5.91 respectively having a p value of 0.01 (statistically significant) [Table 1]. The duration of Motor Block in Group L cases is 26.28 Min. and in Group B cases is 37.10 with a S.D Value of 3.06 and 4.63 respectively, having a p value of 0.01 [Table 2], which is statistically significant. Even though Hemodynamic changes [Table 3] like Pulse Rate, Systolic Blood Pressure, Diastolic Blood Pressure, SPO2 are compared in both study groups, the observations are not significant statistically.

**Table 1: Comparison of duration of sensory blockade**

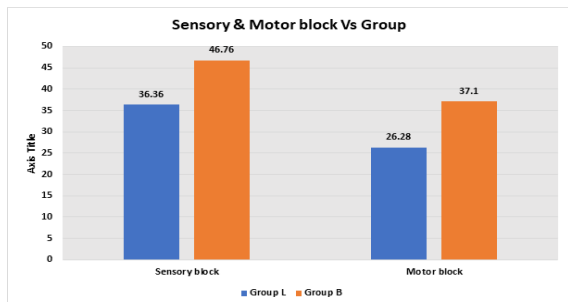
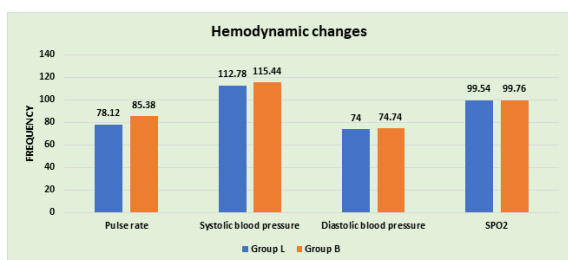
| Group   | Duration of sensory block |      | P Value |
|---------|---------------------------|------|---------|
|         | Mean                      | S. D |         |
| Group L | 36.36                     | 2.62 | 0.01    |
| Group B | 46.76                     | 5.91 |         |

**Table 2: Comparison of duration of Motor blockade**

| Group   | Duration of motor block |      | P Value |
|---------|-------------------------|------|---------|
|         | Mean                    | S.D  |         |
| Group L | 26.28                   | 3.06 | 0.01    |
| Group B | 37.10                   | 4.63 |         |

**Table 3: Hemodynamic changes**

| Variables                | Group L (Mean±S.D) | Group B (Mean±S.D) | P value |
|--------------------------|--------------------|--------------------|---------|
| Pulse rate               | 78.12±9.18         | 85.38± 8.89        | 0.30    |
| Systolic blood pressure  | 112.78±26.77       | 115.44±8.54        | 0.50    |
| Diastolic blood pressure | 74.0 ±8.14         | 74.74±5.62         | 0.59    |
| SPO2                     | 99.54± 0.50        | 99.76±0.43         | 0.21    |

**Figure 1: Comparison of sensory and motor block between groups****Figure 2: Comparison of hemodynamic parameters**

## DISCUSSION

Ambulatory services include admission and discharge of patients within 24 hrs. They can be effectively performed under spinal anaesthesia with the availability of newer local anaesthetics which provide segmental blockage when given in smaller volumes. The local anaesthetics have increased the options available to the anaesthesiologist to provide more effective and predictable anaesthesia with the low dose of drug.

Low dose spinal anaesthesia is a safe, effective & economical alternative to general anaesthesia for ambulatory surgery,<sup>[7]</sup> due to its short-lasting residual effects such as.....

- 1] Delayed mobilisation
- 2] Post op urinary retention
- 3] Effective analgesia

Ambulatory surgery with spinal is now advocated for enhanced recovery of patients in ERAS Protocol.<sup>[8]</sup> We found out that 5mg of both levobupivacaine and bupivacaine provided block upto T8 when placed at L2-L3 interspace and drug is administered slowly. Technological advances have provided anaesthesiologists with a reliable small gauge 26/27/25 G needles which significantly

reduces Post Dural Puncture Headache (PDPH).<sup>[9]</sup> Now-a-days, patients access all categories of surgery have an increasing number of comorbidities like obesity,<sup>[10]</sup> diabetes, hypertension renal diseases, heart diseases & COPD. There is minimal effect on pulmonary and cardiac physiology when the block is between T8-T10 which is possible with low dose 5mg of local anaesthetic. By administering spinal anaesthesia in morbidly obese patients who are more prone for aspiration and respiratory compromise we can avoid obstructive sleep apnoea,<sup>[11]</sup> by avoiding drugs like Benzodiazepines, Opioids and Neuroleptics. Spinal anaesthesia helps in opioid sparing and decreases postoperative nausea & vomiting allowing quick return of oral intake. Though readiness for spinal anaesthesia takes few minutes longer than general anaesthesia, the patient ability to bypass PACU may lead to cost saving.

## CONCLUSION

Ambulatory surgeries can be performed under Spinal Anaesthesia with the availability of newer Local anaesthetic drugs and provide more effective and predictable anaesthesia. Spinal anaesthesia is a safe, effective and economical alternative to General anaesthesia for Ambulatory surgeries. Spinal anaesthesia is now advocated for early recovery of patients in ERAS Protocol. Both Bupivacaine 0.5% and 0.5% Levo-Bupivacaine(1ml) are used in Segmental Spinal Anaesthesia in Tubectomy surgical procedures without any Hemodynamic derangements in both the groups. Both the patient groups are ambulant in 2 to 4 hours and able to breast feed their babies. No patients complained of PONV.

### Acknowledgments

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