



COMPARATIVE STUDY OF ADDING DEXMEDETOMIDINE VS FENTANYL TO INTRATHECAL HYPERBARIC BUPIVACAINE DURING SPINAL ANAESTHESIA IN GYNECOLOGICAL PROCEDURES

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KEYWORDS :

INTRODUCTION

Neuraxial blockade particularly spinal anaesthesia is used for lower abdominal surgeries and lower extremity surgeries, because it has many advantages over general anaesthesia. Lignocaine and Bupivacaine are most commonly used local anaesthetic agents. The adjuvants like alpha2 agonists and opioids are sometimes combined for spinal anaesthesia because they reduce the dose of local anaesthetics and improve analgesic efficacy and decrease the incidence and severity of side effects.

Surgery over uterus and other genital organs performed under spinal or epidural block associated with visceral pain, nausea and vomiting. Fentanyl added because it increase duration of analgesia. Where as alpha 2 agonists like Dexmedetomidine provide sedation and analgesia.

The study was designed to evaluate the efficacy and adverse effects of 5microgram Dexmedetomidine versus 25micrograms of Fentanyl when added to 0.5% Hyperbaric Bupivacaine administered intrathecally in patients undergoing elective abdominal Hysterectomy surgeries.

Aim Of The Study

- 1)To evaluate duration of sensory and motor block
- 2)To asses the intra operative hemodynamics
- 3)To monitor postoperative analgesia
- 4)any complications

MATERIALS AND METHODS

This study was conducted in the Department of obstetrics and gynaecology at viswabharathi medical college ,Kurnool on 60 patient of ASA physical status I and II undergoing Elective Total abdominal Hysterectomy under subarachnoid block. This study was done after Ethical committee approval and a written informed consent obtained from all the patients included in this study.

Study Design

This study was done in a prospective double blinded randomized manner. Each group consisted of thirty patients.

Group D

Patients in this group received 3.0 ml of 0.5% hyperbaric bupivacaine + 5ug [0.5 cc] of preservative free Dexmedetomidine to a total volume of 3.5 ml intrathecally.

Group F

Patients in this group received 3.0ml of 0.5% hyperbaric bupivacaine + 25ug [0.5 cc] of Fentanyl to a total volume of 3.5ml intrathecally. The final volume of injected solution was 3.5ml in both groups.

In this study 0.5% hyperbaric bupivacaine in 8% dextrose, Dexmedetomidine hydrochloride 100ug/1ml and preservative free fentanyl 50 ug/1ml used.

Inclusion Criteria:

- Age:40yrs to 60yrs
- ASA physical status I and II

- BMI:<30kg/m²
- Surgery: elective surgery
- Normal liver and renal function test, coagulation profile.
- Who have given valid informed consent
- Airway: MMS (Modified Mallampatti score) 1 OR 2

Exclusion Criteria:

- Not satisfying inclusion criteria.
- Patient refusal
- Hypersensitivity to the study drug.
- Renal or Hepatic dysfunction
- Bleeding diathesis
- Uncontrolled labile Hypertension & Diabetes mellitus.
- Infection at injection site.
- Patient with anticipated difficult airway.
- Patient with Spine deformity (scoliosis etc.).

Pre Anaesthetic Evaluation

Patients included in this study underwent thorough preoperative evaluation which includes the following

History

History of underlying medical illness, previous surgery and hospitalization.

Physical Examination:

1. Vital signs
2. Height and Weight.
3. Examination of CVS, RS, CNS, Spine
4. Airway assessment.

Investigations:

Haemoglobin (Hb), BT, CT, platelet count, Blood glucose, Renal function test (RFT), Blood grouping and cross matching, ECG, Chest X-Ray (CXR), and 2D echo done where ever necessary. Patient who satisfied the inclusion criteria were explained about the nature of the study and the anaesthetic procedure and written informed consent were obtained from all patients included in the study.

Pre loading:

In the premedication room pulse rate, BP, RR and SpO₂ was noted. An IV line was secured with 18G cannula. Preloading done with RL 500ml over 20-30 minutes.

Technique/ procedure

In the OT appropriate equipment for airway management and emergency drugs were kept ready. Patient is on fasting was shifted from the premedication room to OT. NIBP, SpO₂, ECG leads were connected to the patient and Bladder was catheterised with Foley's catheter. Pre operative base line systolic and diastolic BP, PR, SpO₂ and RR were recorded. The anesthesiologist who were unaware of the drug combination performed the SAB and made observations in all the patients involved in the study. A midline lumbar puncture was performed using a 25G Quincke needle in lateral position. Then patient was placed in supine position. The time of intrathecal injection was considered as 0 and following

Sensory Block

Sensory block was assessed by loss of sensation with pin prick following spinal block upto 15 min.

Motor Block

Motor block was assessed using modified BROMAGE Score

Bromage 0 - Patient is able to move the hip, knee and Ankle

Bromage 1 - Patient is unable to move the hip, but is able to move knee & ankle.

Bromage 2 - Patient is unable to move hip & knee but able to move ankle

Bromage 3 - Patient is unable to move hip, knee and ankle.

Assessment of motor block was started immediately after the intrathecal injection. It was tested every 15 seconds till peak motor block Bromage score was reached. The regression time for sensory and motor block were recorded in post operative ward.

Vital Signs And Side Effects

The systolic and diastolic BP, RR, PR & SpO₂ were recorded every 1mt for 5mts and thereafter every 5mts throughout the intra operative period. The above vital signs at the completion of surgery were noted. Hypotension defined as fall in systolic BP > 30% from baseline or MAP < 60mm of Hg. This was managed with Inj. Ephedrine 6mg increments. Bradycardia was defined as heart rate <50/mt and this was managed with Inj. Atropine 0.01mg/kg iv. Respiratory depression defined as RR <8/mt and or SpO₂ < 85%. This was planned to be managed with bag and mask ventilation or intubation and IPPV if necessary. Blood loss more than the allowable loss was replaced with blood. Vomiting was treated with Inj. ondansetron 4mg iv.

During the surgery side effects of the drugs and untoward incidents were recorded and treated accordingly.

Assessment Of Pain And Duration Of Analgesia

Pain was assessed by visual analog score

0-No pain.

1-3 Mild pain.

4-5 Moderate pain.

6-7 Severe pain.

8-9 Very severe pain

10 Excruciating pain.

Quality Of Surgical Anaesthesia:

Surgical anaesthesia was graded as

Excellent -if there was no complaint of pain at any time during surgery.

Good- if there was minimal pain or discomfort which was relieved by a small dose of iv pentazocine 0.5mg/kg Poor- if GA has to be administered.

Assessment In Post Operative Ward:

The patient was shifted to the post operative ward after completion of surgery. The vitals signs were recorded till the regression of both motor Block (Bromage 0) & the sensory block Till S1) pain was assessed every 15 minutes. When the patient reaches the pain score 2 or 3 Inj. Diclofenac 75mg Im was given. Duration of effective analgesia was defined as the time interval between onset of SAB and the time to reach pain score-2 or 3

TIME FOR SENSORY BLOCK IN MINUTES

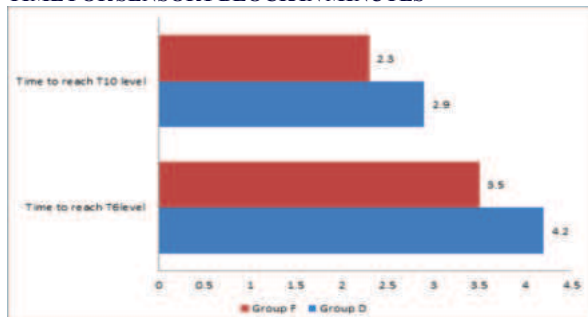


Figure 1

OBSERVATION & RESULTS:

Sixty (60) patients were included in this double blinded randomized controlled study. The patients were divided into two groups. Patients in Group F received 3.0ml [15 mg] of 0.5% Hyperbaric Bupivacaine plus 25µg [0.5cc] of Fentanyl and patients in Group D received 3.0ml [15mg] of 0.5% Hyperbaric Bupivacaine plus 5µg [0.5cc] of Dexmedetomidine (preservative free). Final volume of injected solution was 3.5cc in both groups.

TIME FOR MOTOR BLOCK IN MINUTES

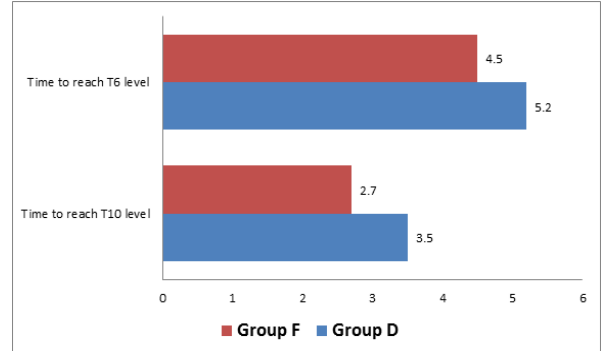


Figure-2

Table 1: Drug Complications

Side effects	Dexmedetomidine	Fentanyl
Hypotension	3	1
Sedation	2	0
Nausea&vomiting	2	2
Pruritis	0	3
Bradycardia	2	1

DISCUSSION:

Subarachnoid Block is a commonly used anaesthetic technique for lower abdominal surgeries. Additives to spinal local anaesthetics Alpha2 agonist like Dexmedetomidine have been shown to prolong the duration of both sensory and motor blockade and to provide extended postop analgesia.

Onset Of Sensory Block

The mean time to onset of sensory Block (T10 level) was 2.97mins in the Group D and 2.33 in the Group F. patients in the F group required a shorter time to achieve T10 level sensory block.

Maximum Level Of Sensory Block

The mean time taken to reach T6 level sensory block was 4.2mins in the Group D and 3.5mins in the Group F. patients in F group required 0.7 less minutes on an average to achieve T6 level sensory block.

Onset Of Motor Block

The mean time taken to reach T10 level motor block was 3.30mins in the Group D and 2.40 mins in the Group F. Patients in F group required 0.833 less minutes on an average to achieve T10 level motor block.

Duration Of Sensory Block

In our study the duration of sensory block was 280± 40 mins in Group F and 340 ± 30 mins. The addition of 5µg of Dexmedetomidine to Hyperbaric Bupivacaine significantly prolonged the duration of sensory block. (Intrathecal Dexmedetomidine when combined with spinal Bupivacaine prolongs the sensory block by depressing the release of c-fibres transmitters and by hyperpolarization of post-synaptic dorsal horn neurons).

Duration Of Motor Block

In our study the mean duration of motor block was 220 ± 30mins in Group F and 290 ± 35mins in Group D. The addition of 5µg of Dexmedetomidine to 0.5% Bupivacaine significantly prolonged the duration of motor block.

Quality Of Surgical Anaesthesia

The quality of surgical anaesthesia was good in both groups.

Complications:

In our study the incidence of Hypotension was seen in 1 subjects in group F and 3 subjects in group D.

Incidence of bradycardia was seen in 1 subjects of group F and 2 subjects of group D.

Incidence of pruritis was was seen in 3 subjects in group F and none in group D which is statistically significant.

Sedation was noted in 2 subjects in group D.

Incidence of vomiting, sedation was not statistically significant but equal in both.

CONCLUSION:

Intrathecal Dexmedetomidine supplementation of spinal block seems to be more effective when compared to intrathecal fentanyl since it produce prolonged sensory block and motor block. It is evident that this type of block may be more suitable for lower abdomen surgeries.

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