



Anaesthesiology

A COMPARATIVE STUDY OF 0.5% ROPIVACAINE (15 ML) VS 0.25% BUPIVACAINE (15 ML) IN TRANSVERSE ABDOMINIS PLANE BLOCK FOR POST OPERATIVE ANALGESIA IN PATIENTS UNDERGOING LOWER SEGMENT CAESAREAN SECTION

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ABSTRACT **Aim and Objectives** We carried out this study to evaluate the efficacy of Ropivacaine vs Bupivacaine for TAP block in providing post-operative pain relief in patients who underwent LSCS under spinal anaesthesia. **Method** Total 50 patients were randomly assigned, on the basis of computer-generated random number table and concealed in envelope. By above method, the patients were divided into two groups (25 patients in each group): **Group - B (Bupivacaine group) (n=25):** TAP (Transverse abdominis plane) block with 15 ml 0.25% Bupivacaine Plain both sides **Group - R (Ropivacaine group) (n=25):** TAP (Transverse abdominis plane) block with 15 ml 0.5% Ropivacaine Plain both sides All patients were assessed for postoperative pain by VAS score and need for rescue analgesia at 0, 4, 8, 12, 24, 36 and 48th hour. Means were compared using Student's t-test. **Results** we observed that the analgesic effect of TAP block with ropivacaine was more effective compared to bupivacaine. Analgesic requirement was more reduced after TAP block with Ropivacaine. 0.5% Ropivacaine provided longer duration [(13.76+5.316 hr) (mean + SD)] of analgesia than 0.25% Bupivacaine [9.28+4.03 hr (mean + SD)] when used in TAP block for patients undergoing lower segment caesarean section. Mean cumulative Inj. Diclofenac sodium (Rescue analgesic) requirement was significantly higher in Group B as compared to Group R. The total dose of Inj. Diclofenac sodium required by patients in Group B in 48 hours was 180+47.43 (mean + SD) mg, while in Group R it was 120+47.43 (mean + SD) mg. (p<0.001). Both drugs have a good safety profile. Both drugs show outstanding clinical utility in terms of reliability and effective analgesia. **Conclusion:** we observed that the analgesic effect of TAP block with ropivacaine was more effective compared to bupivacaine. Analgesic requirement was more reduced after TAP block with Ropivacaine.

KEYWORDS : Bupivacaine, ropivacaine, transversus abdominis plane block

INTRODUCTION

Caesarean delivery is a major surgical procedure after which substantial post-operative pain [moderate to severe] and discomfort can be anticipated and failure to treat it adequately may affect maternal-infant bonding, breast-feeding, as well as may expose the mother to risk of thromboembolism as a result of immobility. The provision of effective post-operative analgesia is of key importance to facilitate early ambulation, infant care and prevention of post-operative morbidity.

Pain of caesarean section essentially has two components - somatic (due to abdominal wall incision) and visceral (from the uterus).

A substantial component of pain experienced by patients is derived from abdominal wall incision. Non steroidal anti-inflammatory drug alone may be insufficient to treat post caesarean pain. Systemic or neuraxial opioid are effective for treating post-operative pain, but associated with number of side effects like nausea, vomiting, pruritus, constipation, and respiratory depression. Currently multimodal analgesia technique involving abdominal field block with parenteral analgesia are becoming popular for these patients.

The abdomen wall consists of three muscle layers, the external oblique, the internal oblique, and the transversus abdominis and their associated fascial sheath. The central abdominal wall also includes the rectus abdominis muscle and its associated fascial sheath. This muscular wall is innervated by afferents that course through the transversus abdominis neuro-fascial plane.

Transversus abdominal plane (TAP) block is a regional block that blocks abdominal wall neural afferent between T6 and L1 and thus can relieve pain associated with abdominal incision. TAP is a neurovascular plane located between internal oblique and transverse abdominis muscle and nerve supplying abdominal wall pass through this plane before supplying anterior abdominal wall. Therefore, if the local anaesthetic is deposited in this space, myocutaneous sensory blockade results.

TAP block has subsequently been used as a component of multi modal analgesia for post operative pain relief following various surgical

procedure such as large bowel resection, open appendectomy, retroperitoneal lymph node dissection, nephrectomy, hernia repair, laparoscopic cholecystectomy and caesarean section.

Method

Total 50 patients were randomly assigned, on the basis of computer generated random number table and concealed in envelope.

By above method, the patients were divided into two groups:

Group - B (Bupivacaine group) (n=25):

TAP (Transverse abdominis plane) block with 15 ml 0.25% Bupivacaine Plain both sides

Group - R (Ropivacaine group) (n=25):

TAP (Transverse abdominis plane) block with 15 ml 0.5% Ropivacaine Plain both sides

All patients were assessed for postoperative pain by VAS score and need for rescue analgesia at 0, 4, 8, 12, 24, 36 and 48th hour. Means were compared using Student's t-test.

Results

we observed that the analgesic effect of TAP block with ropivacaine was more effective compared to bupivacaine. Analgesic requirement was more reduced after TAP block with Ropivacaine.

0.5% Ropivacaine provided longer duration [(13.76+5.316 hr) (mean + SD)] of analgesia than 0.25% Bupivacaine [9.28+4.03 hr (mean + SD)] when used in TAP block for patients undergoing lower segment caesarean section. Mean cumulative Inj. Diclofenac sodium (Rescue analgesic) requirement was significantly higher in Group B as compared to Group R. The total dose of Inj. Diclofenac sodium required by patients in Group B in 48 hours was 180+47.43 (mean + SD) mg, while in Group R it was 120+47.43 (mean + SD) mg. (p<0.001). Both drugs have a good safety profile. Both drugs show outstanding clinical utility in terms of reliability and effective analgesia.

At the end of surgery, TAP block was performed.

- Patient position:

- The patient was in supine position with wedge kept between area of costal margin and iliac crest.

Type of needle:

- 23 G 1.5-inch needle. (hypodermic)

Technique:

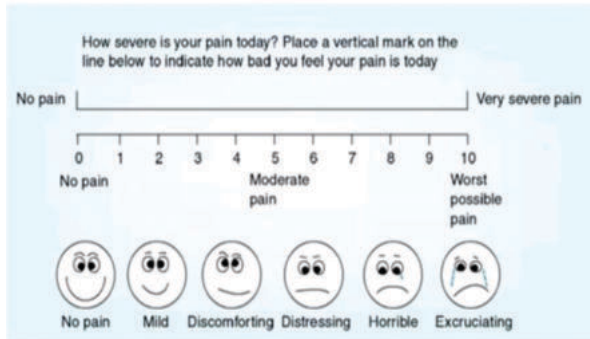
- Landmark technique, described by Rafi et al was used for TAP block in this study.
- This technique accesses the transverse abdominis plane via the lumbar triangle of petit. This is a surface landmark bounded by external oblique muscle anteriorly, the latissimus dorsi muscle posteriorly and the iliac crest inferiorly.
- Identifying the TAP plane: Identify the triangle of petit using anatomical landmarks.
- Insert 23 G 1.5-inch needle perpendicular to the skin
- After piercing the skin, the needle advanced until 'pop' is felt this is the needle piercing the fascial extension of the external oblique muscle. The needle should be advanced until second 'pop' is felt, as the needle passes through the fascial extension of the internal oblique muscle. A loss of resistance technique can also be combined with this 'fascial click' technique to satisfy that the fascia has been breached. The needle should now lie superficial to transversus abdominis muscle in the transversus abdominis plane.
- After aspiration, to exclude malposition of needle tip A 15 ml of 0.25% of Bupivacaine hydrochloride or 15 ml of 0.5% of Ropivacaine Hydrochloride was injected on both sides.

After completion of procedure, all patients were shifted to post anaesthesia care unit (PACU).

VISUAL ANALOGUE SCALE:

The post-operative pain relief was assessed by using 10- point visual analogue scale (VAS) which is the most commonly used method for assessing intensity of acute pain and its relief.

1. VAS is a 10 cm long scale with gradation at every 1 cm from 0 to 10. Score 0 on this scale denote no pain while score 10 denotes the most excruciating pain one can have.
2. Rescue analgesia was given in the form of Inj. Diclofenac Sodium 1.5 mg/kg I.M. when VAS score is >3. Total dose and time of rescue analgesia required in first 48 hour post-operatively was noted.

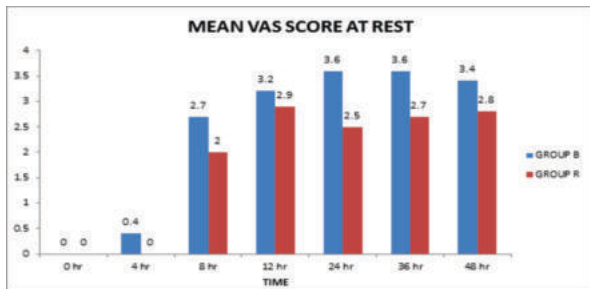


RESULTS

After completion of study observation and results were analyzed statistically. Student T test was applied for comparing the inter group results and the p value calculated.

The results were as follows:

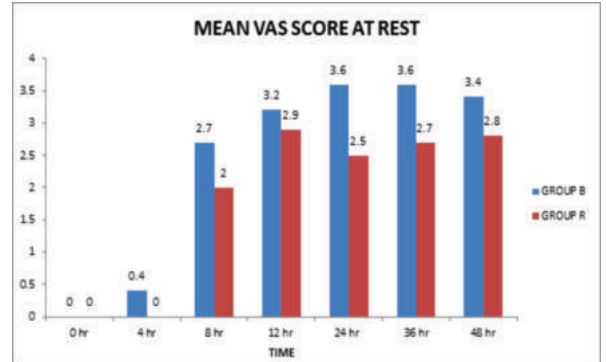
MEAN VAS SCORE AT REST:



The mean VAS score at rest in both groups was 0 at 0 hour. The Mean VAS score was 0.4 in Group B and 0 in Group R at 4 hr. It was statistically insignificant ($P>0.05$). Subsequently, in group B, VAS score at rest was 2.7 at 8 hours after TAP block. In Group R, VAS score at rest 2.0 at 8 hours. It was statistically highly significant ($P<0.001$).

Moreover, at all-time intervals after 4-hour, VAS score at rest was significantly higher in Group B as compared to group R. There was statistically significant difference found in both groups. ($P<0.001$)

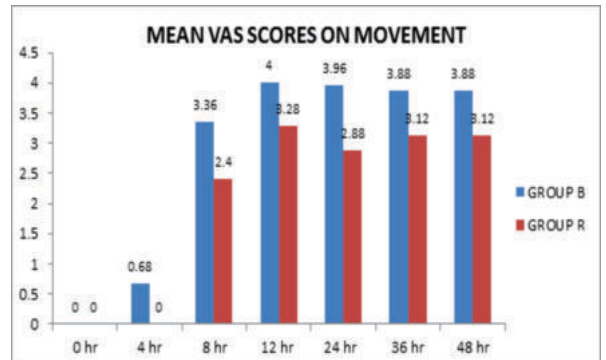
MEAN VAS SCORES ON MOVEMENT:



The mean VAS score at rest in both groups was 0 at 0 hour. The Mean VAS score was 0.4 in Group B and 0 in Group R at 4 hr. It was statistically insignificant ($P>0.05$). Subsequently, in group B, VAS score at rest was 2.7 at 8 hours after TAP block. In Group R, VAS score at rest 2.0 at 8 hours. It was statistically highly significant ($P<0.001$).

Moreover, at all-time intervals after 4-hour, VAS score at rest was significantly higher in Group B as compared to group R. There was statistically significant difference found in both groups. ($P<0.001$)

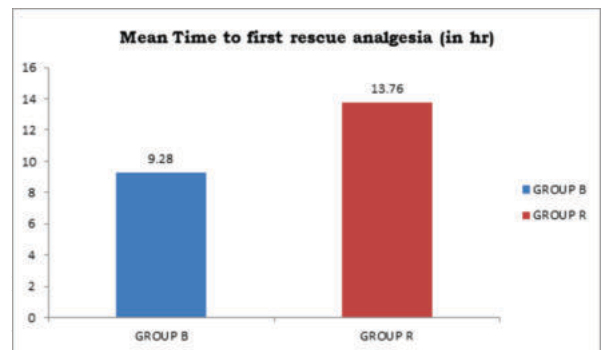
MEAN VAS SCORES ON MOVEMENT:



The mean VAS score at movement in both groups was 0 at 0 hour and 0.68 in Group B and 0 in Group R. It was statistically insignificant ($P>0.05$).

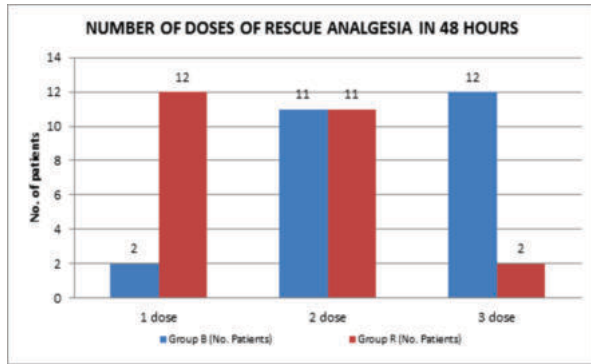
Moreover, at all-time intervals after 4 hours, VAS score at movement was significantly higher in Group B as compared to Group R. There was statistically significant difference found in both groups. ($P<0.001$)

FIRST RESCUE ANALGESIC TIME (MEAN) (IN HOUR):



both groups. ($p < 0.001$)

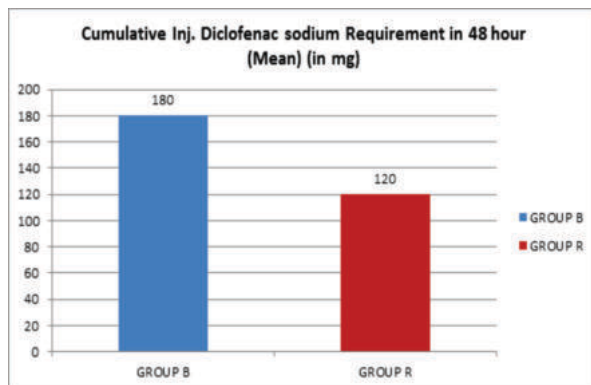
NUMBER OF DOSES OF RESCUE ANALGESIA IN 48 HOURS:



In Group B, 2 patients required 1 dose of analgesic, 11 patients required 2 doses of analgesic and 12 patients required 12 doses up to 48 hours.

In GROUP R, 12 patients required 1 dose of analgesic, 11 patients required 2 dose of analgesic and 2 patients required 3 doses of analgesic up to 48 hours.

CUMULATIVE INJ. DICLOFENAC SODIUM REQUIREMENT IN 48 HOURS (Mean) (in mg) :



The mean cumulative Inj. Diclofenac sodium requirement was significantly higher in Group B as compared to group R. The total dose of Inj. Diclofenac sodium required by patients in group B in 48 hrs was 180 + 47.43 mg, while in Group R it was 120 + 47.43 mg. ($p < 0.001$)

DISCUSSION

The results of our study were as follows:

- Both the groups in our study were comparable to each other with respect to age, weight, height, ASA physical status.
- There was no statistically significant difference in vital parameters like pulse rate, systolic and diastolic BP and Spo2 between both the groups.
- At all-time intervals after 4-hour, mean VAS score at rest was significantly higher in Group B as compared to Group R. There was statistically significant difference found in both groups. ($P < 0.001$) At all-time intervals after 4 hours, mean VAS score at movement was significantly higher in Group B as compared to Group R. There was statistically significant difference found in both groups. ($P < 0.001$)
- Time for first rescue analgesic dose was significantly prolonged in Group R than Group B.
- In our study, the mean cumulative Inj. Diclofenac sodium requirement was significantly higher in Group B as compared to Group R. In group B, most of the patients required 2 to 3 doses of analgesic in 48 hours post-operative period whereas in group R, most of the patients required 1 dose to 2 doses of analgesic. Thus, in Group B a greater number of rescue analgesic doses were required compared to Group R in 48 hours.
- There was no statistically significant difference in the post- block complications in both groups ($p > 0.05$).

CONCLUSION:

To conclude, we observed that the analgesic effect of TAP block with

ropivacaine was more effective compared to bupivacaine. Analgesic requirement was more reduced after TAP block with Ropivacaine.

0.5% Ropivacaine provided longer duration of analgesia than 0.25% Bupivacaine when used in TAP block for patients undergoing abdominal surgery. Both drugs have a good safety profile. Both drugs show outstanding clinical utility in terms of reliability and effective analgesia.

TAP block is easy technique to overcome the pain after caesarean section.

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