



COMPARATIVE STUDY OF 0.25% BUPIVACAINE WITH DEXAMETHASONE AND 0.25% BUPIVACAINE WITH CLONIDINE FOR TRANSVERSUS ABDOMINIS PLANE BLOCK AS POST-OPERATIVE ANALGESIA IN PATIENTS UNDERGOING LOWER SEGMENT CAESAREAN SECTION

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ABSTRACT

To compare 0.25% bupivacaine with dexamethasone and 0.25% bupivacaine with clonidine for transversus abdominis plane (TAP) block as post-operative analgesia in patients undergoing lower segment caesarean section (LSCS). **Materials and Methods:** A randomized prospective controlled clinical study was conducted in 107 patients undergoing LSCS. Participants were divided into two groups in which group A received 0.25% Bupivacaine with Dexamethasone 4mg and those in group B received 0.25% Bupivacaine with Clonidine 75mcg as TAP block at the end of surgery. The postoperative pain was evaluated by visual analog scale (VAS) for pain scoring at every 2 hours for 12 hours postoperatively. Subjective assessment of duration of analgesia was done. **Results:** The average duration of analgesia with TAP block for the overall study population was 316.15 minutes. The average VAS score in patients who received TAP with dexamethasone was 1.50 which is significantly lower than those who received clonidine (1.95) [P value = 0.0001]. Further the duration of analgesia was 151 minutes longer in the first group who received dexamethasone TAP. In majority of the patients (94%) who received clonidine TAP, the analgesia persisted for 2-4 hours. While in patients who received dexamethasone addition, the analgesia persisted for 6-8 hours in 44%.

Conclusion: TAP block is a safe and effective way of relieving postoperative pain in LSCS patients. Addition of dexamethasone to bupivacaine significantly enhances its effect in terms of block quality and analgesia duration as compared to clonidine addition.

KEYWORDS

TAP block; postoperative pain; postoperative analgesia; VAS score.

INTRODUCTION:

Patients undergoing lower segment caesarean section experience moderate to severe pain in the early post-operative period.

A number of modalities have been tried over the years to reduce the post-operative pain of lower abdominal surgery, including systemic analgesia with non-steroid anti-inflammatory drugs (NSAIDs) and opioids, port-site local anaesthetic infiltration, intravenous patient controlled analgesia, patient controlled epidural analgesia and transversus abdominis plane block.

The major trend in the provision of anaesthesia services to pregnant women over the past 25 years has been the increasing use of regional anaesthetic techniques for labour and operative delivery.[1] According to the latest report on Confidential Enquiries into Maternal Deaths in the United Kingdom, at least 80% of caesarean deliveries are now performed under regional block.[2] The report highlights that the likelihood of dying from anaesthesia is now 1 per 100,000 caesarean deliveries, more than 30 times less than it was during the 1960s. This reduction in mortality is clearly associated with the increased use of regional anaesthesia, to which no deaths were attributed in this triennium. This was not always the case, and it is only 15 years since deaths resulting from regional anaesthesia in the United States were evenly divided between local anaesthetic toxicity and high spinal/epidural anaesthesia.[3] In contrast to regional anaesthesia, the safety of general anaesthesia remains unchanged since 1982–1984, and the risk of death attributable to general anaesthesia is now estimated to be 1 death per 20,000 caesarean deliveries. Death is only the tip of the morbidity iceberg, however, and obstetric regional anaesthesia was the source of more than one-third of anaesthesia malpractice insurance claims in the United States during the 1980s and 1990s.[4,5] Obstetric anaesthetists must be familiar with the differential diagnosis of postpartum injuries to be able to recognize rare but potentially life-threatening complications of regional anaesthesia. Such injuries may be intrinsic to labour and delivery or they may result directly or indirectly from obstetric or anaesthetic intervention.[6]

AIM AND OBJECTIVES:

1. To compare the analgesic efficacy of Dexamethasone versus Clonidine as an adjunct with bupivacaine for TAP block.
2. Quantitative assessment of pain relief using visual analog scale (VAS) in patients receiving TAP block.

MATERIALS AND METHODS

A randomized prospective controlled clinical study was done to evaluate the efficacy and safety of transversus abdominis plane (TAP) block using 0.25% bupivacaine with dexamethasone 4mg in comparison to 0.25% bupivacaine with clonidine 75mcg at the end of elective/emergency LSCS surgery for post-operative pain relief. The study was undertaken at IGIMS, Patna, Bihar during the period of 2019-2020.

INCLUSION CRITERIA

- 1) American Society of Anaesthesiologist ASA physical status I-II
- 2) Patients undergoing emergency or elective lower segment caesarean section surgery.

EXCLUSION CRITERIA

- 1) Known allergy to local anaesthetic agents.
- 2) Patients who received any NSAIDs or opioids 48 hours prior to surgery.
- 3) Failed block
- 4) Any contraindication for spinal anaesthesia.

A written informed consent was taken from all patients who underwent emergency/elective LSCS. All the patients belonged to ASA I and II. Patients were randomly divided into two groups of 50 each.

Technique**a) Spinal Anaesthesia b) TAP block**

a) The **post operative pain** was evaluated by visual analog scale (VAS) for pain scoring at every 2 hours for 12 hours. Figure below shows the VAS for pain assessment on a 100 mm line (VAS; 0= no pain, 100=worst pain imaginable).

b) **Duration of analgesia** was calculated from the time of giving block at the end of surgery to the time when VAS was more or equal to 6 (moderate pain).

STATISTICAL ANALYSIS

After data tabulation in Microsoft Excel (Version 2007), descriptive and analytical statistics were performed for the two study groups using the SPSS software (Statistical Package for Social Sciences, Version 21.0, IBM Corporation). Independent 't-test' was carried out to compare the VAS score and postoperative duration of analgesia in the two study groups.

RESULT:

47% of the total study population was between 21-25 years while 19%

belonged to the 26-30 years group. Out of 104 participants, 57 patients weighed between 51 – 60 kgs, while 38 weighed between 61-70 kgs before undergoing surgery. 96% of the patients had completed 37 weeks of gestation. Only 6 patients had a pre-term delivery, of which one delivered at 33 weeks and two delivered at 36 weeks of gestation.

Out of 107 patients 60 (57.8%) underwent an elective LSCS procedure while the remaining underwent an emergency operation. the duration of postoperative analgesia with TAP block is seen for 2-4 hours in the majority of the study population (53%), followed by 6-8 hours duration seen in 21% of the patients. overall study population get post operative pain relief for 2-8 hours.

Pearson's Chi-Square test was performed to find a relationship between the two groups of study population and the duration of analgesia with TAP block. It was seen that the requirement of rescue analgesia was earlier in Group B, while those in Group A could sustain the TAP block for more hours. The correlation was statistically significant (p value = 0.0001) post operative analgesia persisted only for 2-4 hours in 87% of the patients in Group B. While the number of patients who had the effect of TAP block for 6-8 hours postoperatively was much higher in group A as compared to group B.

Summary of Statistics:

Group	N	Mean	Std. Deviation	P value
Age				
A	57	25.19	4.005	0.86
B	50	25.04	4.785	
Weight				
A	57	58.30	11.429	0.88
B	50	58.54	4.339	
Avg. VAS Score				
A	57	1.50	0.237	0.0001
B	50	1.95	0.133	
Duration of Analgesia				
A	57	388.89	145.455	0.0001
B	50	237.60	101.390	

Thus, the use of an effective TAP block can significantly minimise the use of opioids in the postoperative period. Further, dexamethasone is superior to clonidine as an adjunct to bupivacaine in TAP block.

DISCUSSION

block has been shown to reduce postoperative pain scores and opioid consumption, allowing for early ambulation and faster discharge, after a multitude of lower abdominal operations (colectomy, appendectomy, hysterectomy, caesarean section, abdominoplasty, renal transplantation, prostatectomy, iliac crest bone harvest).[7]

Various modalities of giving TAP block include: Landmark technique, ultrasound guided techniques (Sub-costal or posterior approach), catheter placement and surgeon assisted techniques.

The benefits of adequate postoperative analgesia are many, and include a reduction in the postoperative stress response, reduction in postoperative morbidity, and in certain types of surgery postoperative analgesia yields an improved surgical outcome[11]. Other benefits of effective regional analgesic techniques include reduced pain intensity, decrease incidence of side effects from analgesics, and improved patient comfort.[8]

A review and meta-analysis by Mishriky et al[1] suggested that TAP block significantly improved postoperative analgesia in women undergoing caesarean section who did not receive intrathecal morphine (ITM) but showed no improvement in those who received ITM. ITM was associated with improved analgesia compared with TAP block alone at the expense of an increased incidence of side effects. Bharti et al.[9] did a study on 40 adult ASA physical status I to III patients undergoing colorectal surgery who were randomly assigned to receive either 20 ml of 0.25% bupivacaine (TAP group) or normal saline (control group) on each side of the abdominal wall. They found that a 65% decrease in 24-hour total morphine consumption in the TAP group compared with the control group ($P < 0.0001$).

In the present study, the addition of clonidine or dexamethasone to bupivacaine in TAP block was compared. The average VAS score in

patients who received TAP with dexamethasone was 1.50 which is significantly lower than those who received clonidine (1.95) [P value – 0.0001]. Further the duration of analgesia was 151 minutes longer in the first group who received dexamethasone TAP. In majority of the patients (84%) who received clonidine TAP, the analgesia persisted for 2-4 hours. While in patients who received dexamethasone addition, the analgesia persisted for 6-8 hours in 37%.

Inadequate postoperative analgesia is one of the most common causes for poor patient satisfaction following caesarean section. Use of an effective TAP block can significantly minimise the use of opioids which are associated with high incidence of adverse effects, such as postoperative nausea, vomiting and pruritus.

All patients were given rescue analgesia with injection diclofenac 75mg intramuscularly, if VAS score was more than 6. Early demand for rescue analgesia was observed in the clonidine group.

CONCLUSION:

TAP block is a safe and effective way of relieving postoperative pain in LSCS patients and addition of dexamethasone to bupivacaine significantly enhances its effect in terms of block quality and analgesia duration.

TAP block has opioid-sparing effects, reduces antiemetic use and improves overall patient satisfaction with pain relief. In addition to the advantages of a TAP block, supplementation of dexamethasone to bupivacaine significantly increased the duration of analgesia. This ultimately results in early requirement of rescue analgesia in clonidine addition group, while those in the other group could sustain the TAP block for more hours.

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