Original Article

Effectiveness of Local Bupivacaine Wound Infiltration in Post Operative Pain Relief After Caesarean Section

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Abstract

Objective: The objective of my study is to compare local bupivacaine wound infiltration with placebo during caesarean section under spinal anaesthesia in terms of mean pain scores and analgesia requirement

Study Design: Randomized Controlled Trial

Place and Duration: Department of Gynaecology and Obstetrics, Benazir Bhutto Hospital, Rawalpindi, all patients admitted from OPD, Emergency and from High Risk Ward from 16 February 2013 to 15 August 2013.

Results: In our study, 86%(n=43) patients in Group-A and 82%(n=41) of patients in Group-B were between 18-30 years of age, while 14%(n=7) in group A and 18%(n=9) in Group-B were between 31-45 years, mean+sd was calculated as 26.52+4.54 in Group-A and 26.88+4.16 in Group-B. Comparison of pain score in both groups was recorded which was 1.98+0.91 in Group-A and 2.8+1.23 in Group-B, p value was calculated as 0.00026, which shows a significant difference between the two groups. In addition, the comparison of requirement of analgesia in both groups reveals that in Group-A 32.00mg+51.27 and in Group-B 82.00mg+84.97 of tramadol was administered on demand, p value was calculated as 0.00057, which shows a significant difference between the two groups.

Conclusion: We concluded that local bupivacaine wound infiltration is significantly effective as compared to placebo in postoperative pain relief and decreases analgesia requirement after caesarean section.

Key Words: Cesarean Section, Spinal Anaesthesia, Wound Infiltration, Requirement of Analgesia

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Introduction

The Delivery by caesarean section is becoming more frequent. Childbirth is an emotion filled event, and the mother needs to bond with her baby as early as possible.[1]Any intervention that leads to improvement in pain relief is worthy of research. The most appropriate method for pain relief after caesarean delivery remains uncertain.[2] Opioid analgesics continue to be the main stay of treatment despite their side effects. Fear of opioid addiction and respiratory depression often lead to under treatment of postoperative pian.[3,4] The local anaesthetic technique provides good postoperative analgesia with little side effects.[1,5]

Local anaesthetics can be administered as an adjunct to other methods of postoperative pain relief, but reports on the effectiveness of this strategy are conflicting. This study attempted to compare local bupivacaine wound infiltration with placebo during caesarean section under spinal anaesthesia in terms of

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mean pain scores and analgesia requirement.

Caesarean section is a common surgical procedure and rates are increasing worldwide.[6] According to a comparative study conducted in a tertiary care hospital in Nawab Shah caesarean section rate was found to be 36.96% in year 2010.[7] The main indications for caesarean section were previous caesarean section, dystocia, fetal distress, placentaprevia and breech presentation.[7] Postoperative pain after caesarean section remains one of the most important problems and pain control is an issue of current interest.[8] Good postoperative pain relief is important as it decreases patient's distress and helps in rapid uncomplicated recovery.[9] It also reduces the stress response to surgery.[9]

Most appropriate method for the treatment of postoperative pain after caesarean section remains uncertain.[8] Opioid analgesics are the mainstay of treatment despite their side effects[8]. Opioids are associated with many side effects such as dizziness, respiratory depression, ileus, nausea, vomiting, pruritis and urinary retention.[10] Because of good analgesic properties and lack of opioid induced adverse effects, local anaesthetic drugs are increasingly being used in the treatment of surgical pain.[10] Local anaesthetic injection into the wound relieves pain by direct inhibition of noxious impulses from the site of injury.[11] Several studies have reported on use of pre-emptive local anaesthetics to relieve postoperative pain with results ranging from being beneficial to conferring no benefits.[12]

Studies suggest conflicting results regarding efficacy of bupivacaine wound infiltration in reducing postoperative opiod requirement and in decreasing postoperative pain scores. Some studies show high efficacy while others report no wound infiltration to be equally effective.

The aim of this study was to assess the effectiveness of local infiltration of wound with 20 ml of 0.5% bupivacaine after caesarean section on postoperative pain scores and postoperative narcotic requirements, which may help in recommending its use locally.

Methodology

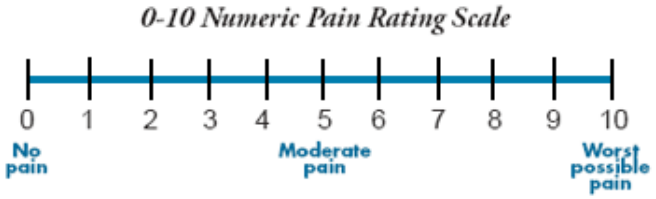
Operational Definitions

Local Wound Infiltration:

- Before closure of abdominal wall incision peritoneum, subcutaneous tissue and skin was infiltrated with 20 ml of 0.5% bupivacaine.

Pain Score:

- It was measured at 24 hours as mean pain score by using visual analogue scale (0-10)



Analgesia Requirement

- Total dose of tramadol patient receives within 24 hours measured as mean dose required. Tramadol was given on patient demand.

Sample Size: With the help of WHO Sample Size Calculator, following are the calculations.

- Level of Significance = 5%
- Power of test = 90%
- Pooled standard deviation = 1.15
- Total value of the population mean = 2^5
- Anticipated population mean = 3.7^5
- Sample Size = n = approx 50 patients in each group (total = 100 patients)

Sampling Collection

Inclusion Criteria	
• Gestational Age at term (37-42)	• Age 18-45 years
• Elective and Emergency Caesarean Sections	• Any parity
• Spinal Anaesthesia	• ASA I and II
Exclusion Criteria	
• General Anaesthesia	• ASA III
• Known allergy to tramadol or bupivacaine	

Data Collection Procedure: Informed consent was taken from all patients. The information was collected in a structured format and included demographic data. Patients admitted in High Risk Ward, Labour Room and Emergency department, undergoing caesarean section were included. Surgical technique of caesarean section was standardized. Number of patients included were randomized into 2 groups of 50 patients each using lottery method. One group was labeled as group A and the other was labeled as group B. It was a single blinded study, so patients did not know in which group they fell. For patients in group A 20 ml of 0.5% bupivacaine was infiltrated into peritoneum,

subcutaneous tissue and skin under direct vision before closure of abdominal wall incision. Group B patients received no local wound infiltration. Both groups received intravenous tramadol on demand for first 24 hours after caesarean section with a usual dose of 400mg/24 hours in 3-4 divided doses. On demand tramadol was given according to patient's request. Postoperative pain was measured using visual analogue scale (0 representing no pain and 10 the most severe pain) at 4, 12 and 24 hours of caesarean section and outcome was measured at 24 hours. The amount of tramadol used on demand was also measured during same time period in both groups. Findings were recorded on proforma.

Data Analysis Procedure: The data was analyzed using SPSS (version 13). For quantitative variables like pain scores on visual analogue scale and amount of tramadol used on demand mean± SD was calculated. Both groups were compared in pain and requirement of tramadol on demand using the independent sample t-test. A p value of < 0.05 was considered as significant.

Results

A total of 100 patients fulfilling the inclusion/exclusion criteria were enrolled to compare local bupivacaine wound infiltration with placebo during caesarean section under spinal anaesthesia in terms of mean pain scores and analgesia requirement.

Age distribution of the patients was done which shows that 86%(n=43) patients in Group-A and 82%(n=41) patients in Group-B were between 18-30 years while 14%(n=7) ladies in group A and 18%(n=9) in Group-B were between 31-45 years. Mean+SD was calculated as 26.52±4.54 in Group-A and 26.88±4.16 in Group-B. (Table No. I)

Table No I: Age Distribution (n=100)

Age (in years)	Group-A (n=50)		Group-B (n=50)	
	No. of patients	%	No. of patients	%
18-30	43	86	41	82
31-45	7	14	9	18
Total	50	100	50	100
Mean±SD	26.52±4.54		26.88±4.16	

Comparison of pain score in both groups was recorded which shows 1.98±0.91 in Group-A and 2.8±1.23 in Group-B, p value was calculated as 0.00026, which shows a significant difference between the two groups. (Table No. II)

Table no II: Comparison of pain score in both groups (n=100)

Mean Pain score	Group-A (n=50)	Group-B (n=50)
	1.98+0.91	2.8+1.23

P value=0.00026

Comparison of requirement of analgesia in both groups reveals that in Group-A 32.00mg ±51.27 and in Group-B 82.00mg ±84.97 of tramadol was given on patient request, p value was calculated as 0.00057, which shows a significant difference between the two groups. (Table No. III)

Table no III: Comparison of Requirement of Analgesia In Both Groups(n=100)

Analgesia requirement (in mg)	Group-A (n=50)	Group-B (n=50)
	32.00+51.27	82.00+84.97

P value=0.00057

Discussion

Post caesarean section pain is an important issue in obstetrics. Several studies have shown the importance of adequate postoperative analgesia on mobilization, rehabilitation, and decreasing the length of hospital stay.[13] Furthermore, it enhances bonding between the mother and the newborn. Attempts are being made to see the effects of local anaesthesia at caesarean section wound in reducing pain and improving postoperative recovery.[14]

Local anaesthetics have been employed as an adjunct to other methods of postoperative pain relief, but reports on the effectiveness of this strategy are conflicting. This study attempted to compare local bupivacaine wound infiltration with placebo during caesarean section under spinal anaesthesia in terms of mean pain scores and analgesia requirement.

In our study, 86%(n=43) females in Group-A and 82%(n=41) in Group-B were between 18-30 years while 14%(n=7) of group A and 18%(n=9) in Group-B were between 31-45 years. Mean+SD was calculated as 26.52±4.54 in Group-A and 26.88±4.16 in Group-B. Comparison of pain score in both groups was recorded which was 1.98±0.91 in Group-A and 2.8±1.23 in Group-B, p value was calculated as 0.00026, which shows a significant difference between the two groups. Finally, comparison of requirement of analgesia in both groups reveals that in Group-A 32.00mg±51.27 and in Group-B 82.00mg±84.97 tramadol was given on patient demand, p value was calculated as 0.00057, which shows a significant difference between the two groups.

According to another study, mean VAS for pain at 24 hours was 2 + 1 vs 3.7 + 1.3 for bupivacaine and distilled water groups respectively.[10] Amount of tramadol used at 24 hours was 98mg+ 26.65 vs 225mg+46.57 for bupivacaine and control groups respectively[8], which shows significantly lower pain score and requirement of postoperative analgesia in patients with local bupivacaine wound infiltration as compared to placebo during caesarean section under spinal anaesthesia.

Another study[12] by Anthony Akinloye Bamigboye and colleagues assessed the effects of local anaesthetic agent wound infiltration and/or abdominal nerve blocks on pain after caesarean section and the mother's well-being and interaction with her baby. They concluded that local anaesthetic infiltration and abdominal nerve blocks as adjuncts to regional analgesia and general anaesthesia are of benefit in caesarean section by reducing opioid consumption.

Whereas, some studies show variable results regarding use of bupivacaine after caesarean section, showing no difference or very small difference between cases and controls. Mean VAS for pain at 24 hours was 2.06 + 0.98 vs 2.38 + 0.75 for bupivacaine and control groups respectively.[8] The mean total amounts of opiod analgesic used by the bupivacaine and normal saline groups at 24 hours were 19.4 mg and 21.4 mg respectively, showing no statistically significant difference.[15]

Similarly, a meta-analysis of 19 trials of pre-incisional versus post-incisional administration of local anaesthetics did not support the pre-incisional infiltrations.[16] This is because only four studies demonstrated reduction in pain, a decrease in analgesic consumption, or a delay until first analgesic request with pre-incisional analgesic in this meta-analysis.

The effectiveness of local infiltration of wound with 20 ml of 0.5% bupivacaine after caesarean section on postoperative pain scores and postoperative narcotic requirements is found significantly higher which may help in recommending its use locally and the hypothesis of the study that "local bupivacaine wound infiltration is better in postoperative pain relief and decreases analgesia requirement after caesarean section" is also justified and recommends it's use in future for controlling postoperative pain. Further studies need to be conducted to see the effectiveness of bupivacaine in postoperative caesarean section pain relief, in order to implement it's usage for this purpose.

Conclusion

We concluded that local bupivacaine wound infiltration is significantly effective as compared to placebo in postoperative pain relief and decreases analgesia requirement after caesarean section

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