Original Article

Comparison of 0.25% Bupivacaine with Tramadol Versus 0.125% Bupivacaine with Tramadol in Epidural B Analgesia for Labor Pain

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ABSTRACT

Objective: To compare the analgesic effects and effectiveness of 0.25% bupivacaine and % and 0.125% bupivacaine with tramadol in labor patients.

Study Design: A randomized comparative and double blind trial study

Place and Duration of Study: This study was conducted at the Anaesthesiology department, Divisional Headquarters teaching Hospital Mirpur from May 2020 to October 2020.

Materials and Methods: Patients who were undergoing for labor pain was given epidural analgesia and seventy females were divided into two groups (A and B). Patients of group A were given 0.25% bupivacaine with tramadol for epidural block. while patients of group B were given 0.125% bupivacaine with tramadol. Hemodynamic changes and pain score were recorded and then data was analyzed.

Results: Less pain was observed in group A then to group B. Blood pressure also dropped significantly in group A patients (6537%) (p-value <0.001) as compared to patients of group B (17.1%).

Conclusion: 0.25% bupivacaine showed better results and showed greater efficacy than 0.125% bupivacaine with tramadol in the treatment and prevention of painful delivery. This also prevents bradycardia and hypotension in epidurally induced labor.

Key Words: Analgesic effects, Bupivacaine, Tramadol, Caesarean section, Hypotension

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INTRODUCTION

Labor is the most excruciating pain experience and even 30% of females find it even more painful then normally expected.[1] There are no general parameters to assess the intensity of the labor pain nonetheless it increased the tendency of cesarean section.[2] Increased pain intensity leads to different physiological and psychological changes including hyperventilation with higher oxygen demand, higher level of catecholamine which results in fetal hypoxia and uteroplacental hypoperfusion.[3]

Women pain experience vary from unbearable pain to moderate level on overall women' assessment of childbirth.[4,5] It negatively impact on women' psychological health and wellbeing.[6] Different pharmacological interventions have been proposed for painless labor out of which epidural labor analgesia is considered as golden method of pain-free labor with higher frequency of maternal satisfaction.[3] Bupivacaine is the commonest local anesthesia used during labor. For achieving better and reliable results, various adjuncts have been used in combination with local anesthesia.[3,7]

Many studies proposed tramadol as adjuncts with bupivacaine due to its anti-nociceptive effects. It also has local anesthetic properties that can be achieved by blocking nerve conduction either by inhibition of K-channels 8 or by interacting with calcium receptors. 9 Thus, tramadol in combination with bupivacaine can provide effective and efficient analgesic effect when given epidurally during labor.[10,11]

Present study was designed for the comparison of 0.25% bupivacaine and 0.125% bupivacaine with tramadol for evaluating pain level. Purpose of present study is to provide safer and better experience during epidurally induced labor that is safe both for neonates and mother.

Literature suggests that during elective c-sections an epidural with 0.75 percent ropivacaine with no opioid can be opted as an alternate of bupivacaine in 0.5%

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having fentanyl. However, this has no benefit in providing rapid anesthetic effect and could result in denser and further extended motor block. Despite the frequent usage of spinal anesthetic 0.75 percent hyper-baric bupivacaine during cesarean most of the countries have only 1% available, therefore research has compared the two percentages for better optimization in patients with similar demographic histories as well as block onset and found that women who received 0.75% bupivacaine took longer time before complaining pain in post-operative care and lesser complications in comparison to 1% bupivacaine administered cases. Literature also supports the fact that isobaric as well as hyper-baric bupivacaine are highly effective during c-sections as a potent epidural. The post-operative time for analgesic activity is prolonged in intrathecal-morphine which further gets extended with the combination of bupivacaine.

MATERIALS AND METHODS

The present study was a comparative analytical study conducted at Div. HQs Teaching Hospital, Mirpur Azad Jammu & Kashmir within the duration of May 2020, to October 2021. This study was approved through the ethical committee before initialization. A total 70 pregnant women were enrolled as participant of the study after taking their written informed consent. The sample size was calculated through WHO based sample size calculator using 95% confidence interval and 5% margin of error keeping proportion 1 and 2 as 88% and 68%. The patients were further divided into two equal numbered groups each with 50 patients in it. Group A was administered 0.25% Bupivacaine with 5mg /ml tramadol while Group B was given 0.125% bupivacaine with 5mg/ml tramadol. The age of the patients was between 20 to 35 years with I and II ASA status and elected for cesarean. Those patients who were selected for epidural analgesia and were in labor were included in the study while patients having any systematic diseases were excluded from this study. Hartmann's-solution was administered as 15ml per kg weight in both groups' patients. Epidural block was delivered as per protocol with a standard positioning and three minutes wait for antisepsis. The procedure included identification of L4-5 and analgesic administration locally by 2-3ml xylocaine. Eighteen-gauge epidural needle was sued for injecting 0.25% and 0.125% bupivacaine post LOR procedure. Post supine positioning initial bolus dosage with 304cm cervical dilation was given in each group keeping a close monitoring of patient's vitals and pain score. The demographic information of each patient was entered in a well-structured questionnaire. Data was entered in SPSS version 25.0 and analyzed through chi square with a p value <0.05 as significant and also by mean and standard deviations.

RESULTS

The mean age of the patients was 31±4 years in group A while 27±4 years in group B. The mean weight of the group A women was 36±4 kg while of group B was 64±5 kilograms. The epidural in cesarean was indicated due to various scenarios including primigravida in 37.1 and 31.4% women while in 34.2 and 48.6% twin pregnancies and PIH 28.5 and 20% women. Table 1.

Table No.1: Comparison of demographic data of mothers in two groups

Variables	Group A (0.5% hyperbaric bupivacaine)	Group B (0.75% hyperbaric bupivacaine)
Age (years)(Mean ± SD)	31±4	27±4
(Weight (kg) (Mean ±SD)	63±4	64±5
Indication of C-Section n(%)		
Primigravida opted for Epidural	13 (37.1)	11 (31.4)
Twin pregnancy	12 (34.2)	17 (48.6)
PIH	10 (28.5)	7(20)

The baseline parameters as systolic and diastolic blood pressure, baseline HR had no significant variance within both groups with a p value >0.05. Table 2

Table No. 2: Comparison of hemodynamic parameters in two groups (Mean ± SD)

Parameter	Group A (n=35)	Group B (n=35)
Systolic	116±7	118±10
Diastolic	66±13	68±10
Mean	82±12	87±11
Baseline HR	102±12	96±15

P value >0.05

The blood loss was more evident in group A in comparison with the group B however patients had higher complains of nausea in group B than in group A. Table 3.

Table No.3: Comparison clinical parameters of mothers in two groups

Parameter	Group A (n=35)	Group B (n=35)
Group B (n=35)	945±60	960±75
Blood loss (ml)	180±60	150±60
Nausea(N)	2(5.7%)	5(14.2%)

The heart rate was observed at a similar rate within both groups as well as a significant decrease in blood pressure was noticed within both groups. In 17.1% cases where a significant decrease in blood pressure

was observed in group A, 10 mg ephedrine was administered where as in 65.7% of cases from group B received similar 10mg ephedrine due to hypotension. Fig 1.

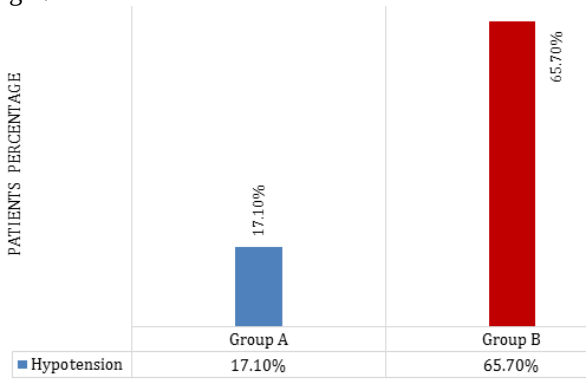

Figure No.1: Comparison of development of hypotension in the groups

DISCUSSION

In present study, 0.25% bupivacaine and 0.125% bupivacaine with tramadol was epidurally administered for better experience and painless delivery. Same dose of bupivacaine was administered in each participant regardless of their heights as studies proposed that, there is no effect of height on the amount of dose. Less incidence of adverse effects was observed with 0.125% bupivacaine. Significant positive effects were achieved with 0.25% bupivacaine in contrast to 0.125% bupivacaine.[12,13]

In present study, SBP significantly dropped after 0.25% bupivacaine administration in patients. Similar has been reported in somewhere else.[14,15] Heart rate was also not significantly dropped in any of the group. In current study, blood loss and nausea/vomiting was also noted in both the groups. Nausea was observed in 5.7% of the group A participants whereas 14.2% of group B participants. Results of other studies demonstrated upto 60% of vomiting/nausea rate after bupivacaine administration.[16,17]

Tramadol has been extensively used for epidurally induced labor that can be given through intramuscular[18,19] or intravenous routes 20. It gives satisfactory results without causing respiratory depressant effect and was safe both for fetus and mother. Incidence of maternal satisfaction was also analyzed. Excellent maternal satisfaction was observed through study participants. This study gives comparative analysis of dosage use for better labor outcomes and 0.25% bupivacaine with tramadol gave good results as compared to 0.125% bupivacaine.

CONCLUSION

Significant difference in pain scores and hemodynamic parameters between both the groups was observed. 0.25% bupivacaine with tramadol showed more effective results during analgesic labor in contrast to 0.125% bupivacaine in combination with tramadol.

Author's Contribution:

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Conflict of Interest: The study has no conflict of interest to declare by any author.

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