

# AMBULATORY EPIDURAL ANALGESIA FOR PAINLESS LABOUR: COMPARISON BETWEEN BUPIVACAINE PLUS FENTANYL AND BUPIVACAINE PLUS TRAMADOL

Sami Wahid, Uzma Noreen, Imran ul Haq, Ahmed Raza, Faisal Hanif, Ahmed Waqas

Combine Military Hospital Tarbela, Lahore, Nowshera, and HIT Taxilla, Pakistan

## ABSTRACT

**Background:** In modern obstetrics alleviation of labour pains by simple, safe and effective means presents a unique problem. Epidural analgesia has emerged as a popular and relatively safe option. This study was conducted to compare the efficacy of bupivacaine plus tramadol and bupivacaine plus fentanyl for ambulatory epidural analgesia in spontaneous vaginal delivery. **Methods:** This quasi-experimental study was carried out on 100 patients, ranging from 20 to 30 years age, having American Society of Anaesthesiology status I, primigravida, singleton with cephalic presentation, at PNS Shifa Hospital Karachi. The study was carried out from April 2007 to April 2008. Sampling technique was non-random convenient. **Results:** In Group-A pain after first dose was reduced at 10 minutes. But in Group B the action was delayed and analgesia was not adequate. After 20 min the analgesic effects in both groups were similar. Bupivacaine with fentanyl was associated with 96% patient satisfaction while bupivacaine with tramadol 92%. **Conclusion:** Analgesia with bupivacaine plus fentanyl and bupivacaine plus tramadol for ambulatory epidural analgesia in spontaneous vaginal delivery are equal in efficacy.

**KEY WORDS:** Ambulatory labour analgesia, Epidural analgesia, Bupivacaine, Fentanyl, Tramadol.

## INTRODUCTION

Labour pain relief is an important aspect of women's health that has historically been neglected.<sup>1</sup> It has been suggested that confining women to bed during labour may cause the labour to be longer and more painful, with an increased abnormal presentation, instrumental delivery and foetal distress. Walking or ambulatory extradural labour analgesia is a novel approach to the painless labour.<sup>2</sup> In general women dislike the inability to void, often-dense motor block, feeling of numbness of the lower body, total lack of urge to bear down, and complete perineal anaesthesia. Continuous search for balanced labour analgesia that provides relief from pain, while preserving motor functions, has led to the development of an ambulatory labour analgesia technique.<sup>3</sup> Ambulatory epidural analgesia (AEA) is a popular choice for labour analgesia because ambulation reportedly increases maternal comfort, increases the intensity of uterine contractions, avoids inferior vena cava compression, facilitates foetal head descent, and relaxes the pelvic musculature, all of which can shorten labour.<sup>4</sup>

Various techniques of neuraxial anaesthesia are used including the options of patient-controlled epidural analgesia (PCEA) and combined spinal

epidural analgesia (CSEA). CSEA has attained wide spread popularity in obstetric anaesthesia worldwide. The onset of analgesia is rapid and reliable, and maternal satisfaction is high. It offers the possibility of combining rapid onset of subarachnoid analgesia with the flexibility of continuous epidural analgesia.

Epidural analgesia has been used extensively, using mixtures of low dose local anaesthetics and opioids to provide pain relief in labour. Ambulation during labour is becoming more popular. Walking had no impact on either duration of labour or pain relief, it was associated with a reduction in both bupivacaine and oxytocin requirements.<sup>5</sup>

This study was conducted to compare the efficacy of bupivacaine plus tramadol with bupivacaine plus fentanyl for ambulatory epidural analgesia in spontaneous vaginal delivery.

## MATERIAL AND METHODS

This study was carried out at PNS Shifa Hospital Karachi, which is a tertiary care hospital. All patient included in the study were of American society of Anaesthesiology (ASA) status I, age

between 20 to 30 years, primigravida and singleton with cephalic presentation. Any patient with cardiovascular, pulmonary, renal or liver disease, twin pregnancy, breech presentation or cephalo-pelvic disproportion was not included.

Informed consent was taken from all the patients undergoing the study. Patients were divided into two groups. Both the groups were preloaded with Ringer's lactate 500ml, Epidural catheter was placed in epidural space  $L_3-L_4$  under aseptic techniques. Patients assigned to group A received Bupivacaine 0.125% with fentanyl 2ug/ml, 10ml after test dose. The patients in group B received Bupivacaine 0.125% with Tramadol 5mg/ml, 10ml after test dose. The patients in both the groups received epidural analgesia during first stage of labour in supine position, during the second stage of labour, top up dose (10 ml) was given in sitting position. Top-ups were given on patient demand (2 to 3 top-ups were given to all patients on demand). The gynaecologist in labour room moni-

tored progress of the labour, and foetal wellbeing. Blood pressure and pulse was recorded five minutes after the administration of bupivacaine in epidural catheter. Pain and motor blockade was assessed by the anaesthesiologist in both stages of labour. Method of assessment of pain was Visual Analogue Scale. Patient's satisfaction regarding pain relief was asked one hour after the delivery.

The data collected was entered in the Statistical Package for Social Sciences (SPSS) version 14.0 and analyzed. Student t-test was applied as the test of significance.

## RESULTS

In group A, pain was reduced after first dose at 10 min. But in group B the action was delayed and analgesia was not adequate. After 20 min the analgesic effects in both groups were similar. Pain was scored according to visual analogue scoring (1-10). Pain in both groups before and after the first dose and after second

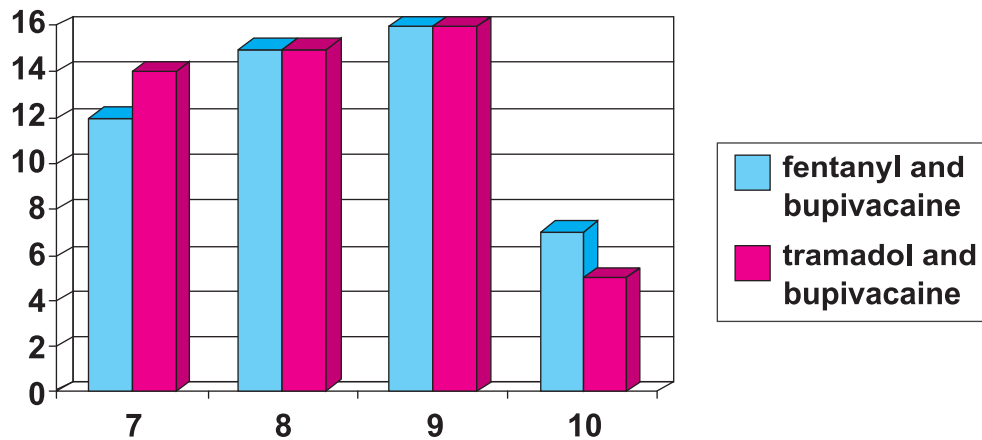


Fig. 1: Pain score before first dose.

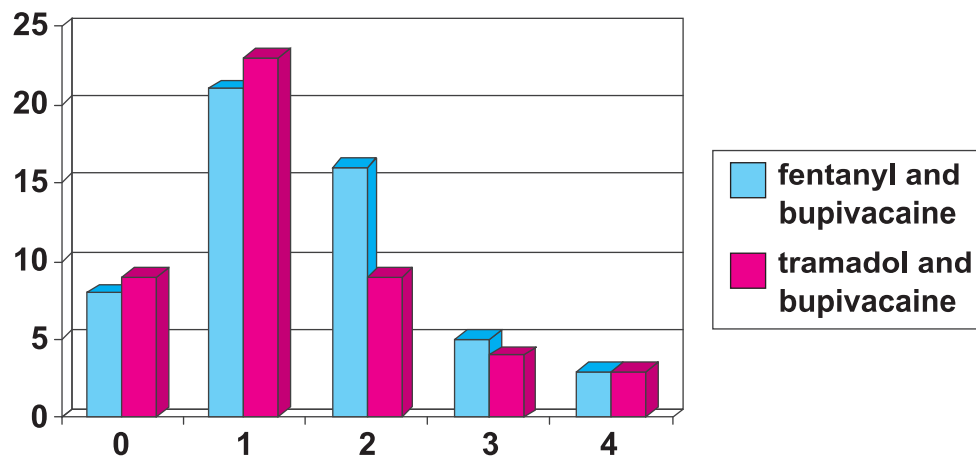


Fig. 2: Pain score after first dose.

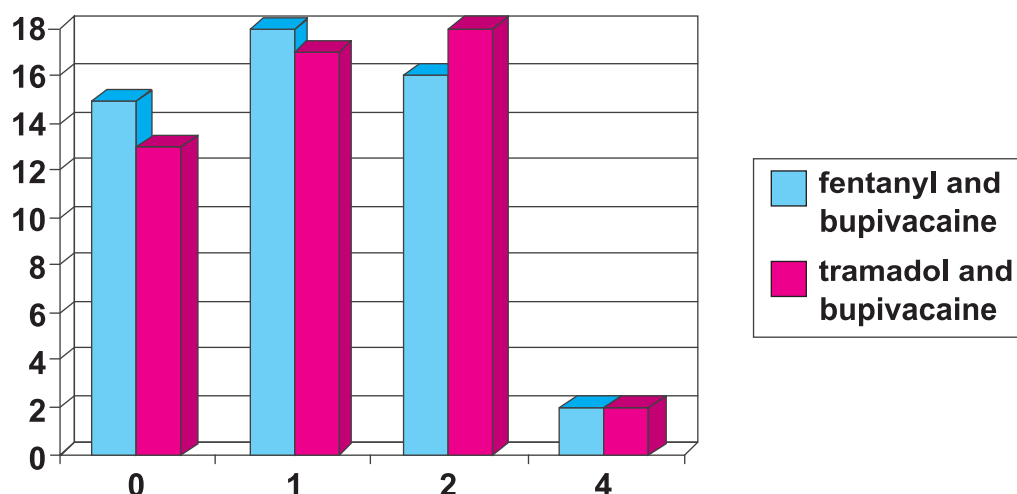


Fig. 3: Pain score after second dose.

dose is shown graphically in graphs 1, 2 and 3. P-value for the difference between both the techniques was 0.65 which is statistically not significant. With tramadol plus Bupivacaine incidence of side effects like vomiting, pruritis, nausea were less (dermatological 11%, nausea and vomiting 40%) as compared to other group Bupivacaine and Fentanyl (dermatological 60%, nausea and vomiting 50%). Only two patients of group A were not satisfied as compared to four patients of group B, regarding pain relief one hour after the delivery.

## DISCUSSION

Regional techniques employing the epidural or intrathecal routes alone or in combination are currently the most popular methods of pain relief during labour and delivery. They can provide excellent pain relief, yet allow the mother to be awake and cooperative.<sup>7</sup> The need for individualisation of analgesic therapy in labour cannot be overemphasised.<sup>8</sup> Continuous search for balanced labour analgesia that provides relief from pain, while preserving motor function, has led to the development of ambulatory labour analgesia technique.<sup>6</sup> Low-dose epidural analgesia during the first stage of labour was superior to parenteral pethidine regarding pain relief and side effects.<sup>9</sup> The progress of labour ideally leads to a normal, spontaneous, vaginal delivery. Many factors, maternal, fetal, obstetrical and anesthetic may collectively contribute to delaying or precluding an ideal outcome. Epidural anesthesia is not a singular phenomenon.<sup>10</sup>

Excellent analgesia with minimal side effects started an era of ever increasing numbers of women who opt for the 'painless birth experience'.<sup>11</sup> Epidural analgesia along with an experienced anes-

thetist, a dedicated obstetrician and a trained midwife can convert the painful labour into a less stressful event.<sup>12</sup> There are many studies carried out on different types of drugs. Cellino *et al* conducted a study to evaluate the analgesic effect of Fentanyl plus 0.125% Bupivacaine for painless labour and found that the main advantage of the addition of 100 µg of Fentanyl to 0.125% Bupivacaine is to increase the quality of analgesia, including at the same time the increase of safety for the mother, without affecting the newborn.<sup>13</sup> Campbell *et al* conducted the study and compared Bupivacaine plus Fentanyl and Ropivacaine plus Fentanyl and found that 20 ml of both dilute concentrations of Bupivacaine and Ropivacaine combined with Fentanyl provide equally effective epidural labour analgesia with no adverse maternal or fetal effects.<sup>14</sup> Frikha *et al* found that Sufentanil combined with Bupivacaine provides rapid-onset and profound analgesia during the first stage of labour without adverse maternal or fetal effects while Tramadol with Bupivacaine had long lasting analgesia.<sup>15</sup> Abraham *et al* concluded that the addition of lumbar epidural Fentanyl 100 µg to 15 mg of epidural Bupivacaine provides good control of labour pain with no motor blockade and established that this combination preserves dorsal column sensory function.<sup>16</sup> Haq *et al* conducted a study on different concentrations of Bupivacaine plus Fentanyl and concluded that 0.125% Bupivacaine plus Fentanyl provides effective analgesia with minimal motor blockade and intact proprioception.<sup>17</sup> RM Sharma *et al* conducted a study for evaluating effective method of pain relief in labour and found that 0.1 % Bupivacaine with 2µg/ml Fentanyl maximizes labour pain relief and minimizes side effects.<sup>18</sup> In the past no study had been carried out which compared Fentanyl and tramadol with Bupivacaine, In this study we

have found that tramadol with Bupivacaine is equally effective as compared to Fentanyl plus Bupivacaine as far as analgesia is concerned although onset of action with Fentanyl was earlier than tramadol but after 20 minutes the analgesia was effective in both the groups. However with tramadol plus bupivacaine incidence of side effects like vomiting, pruritis, nausea were less as compared to other group. Hence as far as the effect of analgesia is concerned the results of our study in accordance with all of the above mentioned studies.

Many methods have been tried in the past for analgesia during labour, most of them are associated with maternal or fetal side effects and no single method have proved to be adequate as far as patient's satisfaction is concerned. The interpersonal relationships established between patient and healthcare providers may ultimately be of more importance in the determination of satisfaction with management.<sup>19</sup> Murphy *et al* conducted a study to evaluate maternal satisfaction with bupivacaine versus bupivacaine plus Fentanyl and concluded that maternal satisfaction from conventional epidural analgesia can be improved. Epidural Fentanyl combined with Bupivacaine to reduce operative deliveries and confer other advantages that may increase maternal satisfaction.<sup>20</sup> Fine gold *et al* conducted study on Ropivacaine plus Fentanyl and Bupivacaine plus Fentanyl and summarized that both Bupivacaine and Ropivacaine produce satisfactory labour analgesia.<sup>21</sup> The results of our study show that bupivacaine plus fentanyl is associated with 96% patient satisfaction while Bupivacaine plus tramadol is associated with 92% patient satisfaction.

## CONCLUSION

For ambulatory analgesia bupivacaine with tramadol is equally effective as compared to bupivacaine with fentanyl. Although the onset of action with fentanyl was earlier than tramadol but after 20 minutes the analgesia was equally effective in both the groups.

## REFERENCES

- Campbell DC. Low dose epidural labor analgesia. Techniques in regional anesthesia and pain management. 2001; 5: 3-8.
- Campbell DC. Labour analgesia: what is new and PCEA. Can J Anaesth 2003; 50: 1-9.
- Krzysztof M, Kuczkowski. Ambulatory labour analgesia: what does an obstetrician need to know? Acta obstet et Gynaecol Scand 2004; 83:415-24.
- Vallejo MC, Firestone LL, Mandell GL, Jaime F, Makishima S, Ramanathan S. Effect of epidural analgesia with ambulation on labour duration. Anaesth 2002; 97: 525.
- Kuczkowski KM. Ambulation with combined spinal-epidural labour analgesia: Acta Anaesthesiol Belg 2004; 55: 29-34.
- Frenea S, Chirossel C, Rodriguez R, Baguet JP, Racinet C, Payen JF. The effects of prolonged ambulation on labour with epidural analgesia. Anesth Analg. 2004; 98:224-9.
- Morgan GE. Obstetric Anaesthesia. Clinical anaesthesiology 2006; 895 Lang Medical Books/ McGraw-Hill Medical Publishing Division.
- Sia AT, Lim Y, Ocampo CE. Computer-integrated patient-controlled epidural analgesia: a preliminary study on a novel approach of providing pain relief in labour. Singapore Med J 2006; 47: 951-6.
- Philipsen T and Jensen NH. Maternal opinion about analgesia in labour and delivery. A comparison of epidural blockade and intramuscular Pethidine. Eur J Obstet Gynecol Reprod Bio 1990; 34: 205-10.
- Wittels B. Does epidural anesthesia affect the course of labour and delivery? Semin Perinatol. 1991; 15: 358-67.
- Van de Velde M. Neuraxial opioids for labour analgesia: analgesic efficiency and effect on labour. Curr Opin Anaesth 2002; 15: 299-303.
- Lubna J, Anbrin S, Naheed JF. Epidural analgesia in labour in relation to the rate of instrumental deliveries. King Edward Med Coll 2005; 11:307-10.
- Danilo Celleno MD, Giorgio Capogna MD. Epidural Fentanyl plus Bupivacaine 0.125% for labour: analgesic effects. 375-8.
- David C, Campbell R M, Zwack Lesley-Ann L, Crone Ray WY. Ambulatory Labour Epidural Analgesia: Bupivacaine versus Ropivacaine. Anesth Analg 2000; 90:1384-9.
- Frikha N, Ellachtar M, Mebazaa, Ben Ammar. Combined spinal-epidural analgesia in labour—comparison of Sufentanil vs Tramadol. Middle East J Anesth 2007; 19: 87-96.
- M. Abrahams, P. Higgins, P. Whyte, P. Breen, S. Muttu, J. Gardiner. Intact proprioception and control of labour pain during epidural analgesia. Acta Anaesthesiologica Scandinavica 2002; 46-50.
- Haq SN, Anjum A, Qammar M, Gulnar Z, Aftab I. Comparison of different concentration of Bupivacaine (0.1%) /0.2% with Fentanyl 2 microgram/ml by epidural infusion for labour analgesia. Ann Abbasi Shaheed Hosp Karachi Med Dent Coll 2005; 10: 650-4.

18. Sharma RM, Setlur R, Bhargava AK, Vardhan S. Walking epidural: an effective method of labour pain relief. *MJAFI* 2007; 63: 44-6.
19. Law Andrew Rossa. 11 maternal satisfactions with labour analgesia, *Bailliere's Clinical Obstetrics Gynaecology* 1998; 12: 499-512.
20. Murphy JD, Henderson K, Bowden MI, Lewis M, Cooper GM. Bupivacaine versus Bupivacaine plus fentanyl for epidural analgesia: effect on maternal satisfaction.
21. Helene F, Gordon M, Sivam R. Comparison of ropivacaine 0.1% fentanyl and Bupivacaine

0.125% Fentanyl infusions for epidural labour analgesia. *Can J Anesthesia* 2000; 47: 740-5.

**Corresponding Author:**

Dr. Sami Wahid  
Department of Anesthesia  
Combined Military Hospital  
Tarbela, Pakistan  
E-mail: samiwahid80@ymail.com