

EVALUATION OF EFFECT OF EPIDURAL ADMINISTRATION OF FENTANYL ADDED TO BUPIVACAINE, ON POST-OPERATIVE ANALGESIA, IN GYNAECOLOGICAL SURGICAL PATIENTS

Balasubramanyam Vallem¹, Radha Juvvala², Aneela Satya Ravanam³, Srikanth Reddy Challapalli⁴, Sujana Thalamati⁵, Saisurej Karranaga⁶

HOW TO CITE THIS ARTICLE:

Balasubramanyam Vallem, Radha Juvvala, Aneela Satya Ravanam, Srikanth Reddy Challapalli Sujana Thalamati, Saisurej Karranaga. "Evaluation of Effect of Epidural Administration of Fentanyl Added to Bupivacaine, on Post-Operative Analgesia, in Gynaecological Surgical Patients". Journal of Evidence based Medicine and Healthcare; Volume 2, Issue 17, April 27, 2015; Page: 2539-2544.

ABSTRACT: Post-operative pain, which is most stressful, is receiving more attention recently. Almost each surgical procedure is associated with post-operative pain and severity depends on site and nature of surgery.¹ since the newer narcotic analgesics are no more effective as analgesics than the old; and various traditional modes of administration are associated with significant complications role of Epidural administration of Narcotic drugs has come into vogue.² Despite the availability of many techniques to reduce postoperative pain, the search is on for a safe, simple and readily available procedure to lessen the post-operative pain. In this study we are trying to assess the effect of Epidural administration of Fentanyl added to Bupivacaine in Gynaecological surgical patients, studying its efficacy and duration of post-operative analgesia, which is likely to reduce the complications associated with narcotic usage and effective post-operative analgesia.

KEYWORDS: Post-operative pain, Epidural, Fentanyl, Analgesia.

AIM OF THE STUDY: This study was done to evaluate the efficacy of Epidural Fentanyl added to Bupivacaine in Gynaecological Surgical Patients at a tertiary care Hospital.

INTRODUCTION: The international Association for the study of pain defines pain as - an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. Post-operative pain, which is most stressful, is receiving more attention recently. Almost each surgical procedure is associated with post-operative pain and severity depends on site and nature of surgery. Post-operative pain is intense during the first 24 hrs. and diminishes by 3 to 4 days. Management of postoperative pain has been done in two phases, one is the preventive aspect and the other is the actual treatment of the pain.³

Since the newer narcotic analgesics are no more effective as analgesics than the old; intermittent intramuscular injections have been shown to produce unpredictable blood levels of the narcotic. Most attention is directed towards the continuous intravenous infusion of narcotics using mechanically driven syringes. Demand analgesia is another approach to give the patient a continuous period of pain relief. These methods are always potentially dangerous if constant monitoring is not available. The problems of respiratory depression and cardiovascular depression can be serious. Epidural analgesia has been another method. The extradural and intratracheal use of narcotics has been heralded as a valuable advance in pain relief.²

Despite the availability of many techniques to reduce postoperative pain, the search is on for a safe, simple and readily available procedure to lessen the post-operative pain.

The present study is to evaluate the efficacy of epidural fentanyl added to bupivacaine, in relieving the post-operative pain in gynecological surgeries such as total abdominal hysterectomy, and vaginal hysterectomy, where the surgery is the major one and involves cutting deeper structures, intense analgesia is required in these cases in post-operative period.

Salomaki TE et. al (1996) conducted a study of epidural Fentanyl for on-ward pain relief after major surgery. Epidural Fentanyl infusion was administered by ward nurses and they prospectively assessed pain and side effects during Fentanyl infusion for median duration of 41 hours after surgery in 305 consecutive patients. Three patients (0.9%) showed a diminished respiratory rate (<10/min), not statistically significant. Nausea and pruritus were minor problems. It was concluded that with well trained nurses, careful monitoring and appropriate protocols, epidural Fentanyl infusion proved to be a feasible method for pain relief after major surgery in a surgical ward.

Due to lipophilic nature of Bupivacaine, the uptake of the drug by the tissue is large. Bupivacaine blocks impulses by reducing the current through voltage activated sodium channels. This inhibition is nonspecific. Binding of bupivacaine to sites on voltage gated channels, prevents opening of the channel by inhibitory conformational changes.

Fentanyl is a synthetic opioid, related to the phenylpiperidines which is highly lipid soluble.⁴ Fentanyl is μ -receptor agonist approximately 100 times more potent than morphine. Fentanyl is a popular drug in anaesthetic practice because of its relatively shorter time to peak analgesic effect, rapid termination of effect after small bolus doses, and relative cardiovascular stability. The principal actions of therapeutic value are analgesia and sedation. Alterations in respiratory rate and alveolar ventilation, associated with narcotic analgesics, may last longer than the analgesic effect.⁵ as the dose of narcotic is increased, the decrease in pulmonary exchange becomes greater. Large doses may produce apnoea.⁶

METHODOLOGY: The present study "Evaluation of Effect of Epidural administration of Fentanyl added to Bupivacaine, on Post-Operative analgesia, in Gynaecological Surgical Patients" was undertaken at Sri Venkateswara Medical College and Government Maternity Hospital, Tirupati, during the period of March 2013 to October 2014.

Selection of Patients: Hundred Patients were selected for the study who was adult females posted for elective gynaecological surgeries aged between 30 to 60 years, who had no complicating systemic disorders (ASA Gr I and II). Fentanyl 2mcg/kg was given epidurally in the post-operative period added to 10ml of 0.125% Bupivacaine.

A total of 100 female patients between the ages 30-60 years were selected randomly. All patients were visited on the day prior to surgery and explained in detail regarding the anaesthetic procedure. A detailed pre-anaesthetic evaluation with detailed history, systemic and general examination were carried out, patients having pregnancy, respiratory, cardiovascular and metabolic disorders were excluded from the study.

ORIGINAL ARTICLE

In the visual analogue scale the patients were shown a scale of 10 cm length. Zero end of the scale was taken as 'No pain' and 10 cm mark as 'Maximum pain'. Intensity of pain increases gradually from '0' to '10'. Patients were instructed to point the intensity of pain on the scale.

For the purpose of assessing the pain

- 0 - 2.5 cm taken as no pain.
- 2.5-5 cm taken as mild pain.
- 5 - 7.5 cm taken as moderate pain.
- 7.5 - 10 cm taken as severe pain.

Onset of sensory blockade with pin prick test and motor blockade with Bromage scale.

Scale	Criteria
0	Free movements of legs and feet, with ability to raise extended leg.
1	Knee flexion is decreased, inability to raise extended leg, full flexion of feet and ankles present
2	Inability to raise legs or flex knees, flexion of ankles and feet present.
3	Inability to raise legs, flex knees or ankle or move toes.

Table 1: Bromage scale.⁷

Duration of analgesia: The need for rescue analgesia was taken when the patient complains of pain after the study drug given and the duration of analgesia was measured from the time of epidural injection to the time of first rescue analgesia. Time at which patients complained of pain more than 5 cms on the scale was noted. That point was taken as the end of fair analgesia and at that point, top up doses of same drug with same dosage given.

Side effects: Like nausea, vomiting, hypotension, respiratory depression and pruritus allergic reaction were looked for.

In the postoperative ward, nursing staff were instructed to note the time of rescue analgesia and subsequent top up doses were given with Injection fentanyl 75mcg in 10ml of Bupivacaine.

OBSERVATION AND RESULTS: This study consists of 100 adult females undergoing elective gynaecological surgeries. All the patients received Fentanyl citrate with 10ml 0.125% Bupivacaine epidurally post operatively. The effect of post-operative analgesia was compared and contrasted.

- Chi-square test.
- Student t-test (Paired and unpaired t-test).
- P value of <0.05 significant <0.01 – Highly significant, <0.001 – Very highly significant, >0.05 not significant.

ORIGINAL ARTICLE

Onset of Analgesia	No. of cases	Percentage
7 minutes	33	33%
8 minutes	23	23%
9 minutes	7	7%
10 minutes	20	20%
11 minutes	4	4%
12 minutes	7	7%
12 minutes	6	6%
Total	100	100%

TABLE 2: ONSET OF ANALGESIA

The minimum time required for the onset of analgesia was 7 minutes and maximum time required was 18 minutes. 33 cases (33%) had onset in 7 minutes, which happens to be the largest group too.

The duration of post-operative analgesia in hours.

Onset of Analgesia	No. of Cases	Percentage
2 hours	26	26%
2 Hrs. 30 mins	63	63%
3 Hrs.	11	11%
Total	100	100%

TABLE 3: DURATION OF POST-OPERATIVE ANALGESIA

The analgesia lasted for 2 hours 30minutes in 63% of cases.

TIME	RESP. RATE
Basal	16
'0' min	15
'15' min	15
'30' min	15
'45' min	16
'60' min	15
2 nd hour	16
3 rd hour	16
6 th hour	16

TABLE 4: MEAN RESPIRATORY RATE

At 5% level of significance the table value of X greater than the calculated value X. Hence it is insignificant. $P > 0.05$.

ORIGINAL ARTICLE

Side effects	Nausea	Vomiting	Pruritus	Urinary retention	Resp. depression	Hypo-tension
No. of Cases	10	0	17	0	0	0

TABLE 5: COMPLICATIONS

At 5% level of significance the table value of X greater than the calculated value X. Hence it is insignificant. $P > 0.05$. Complications reported were nausea in 10 cases (10%) pruritus 17 cases (17%). No other complications were observed.

DISCUSSION: In this prospective study, an effort was made to analyze the efficacy of Fentanyl added to Bupivacaine, by epidural route, among Gynaecological surgical patients. Mean time of onset of analgesia in our study was 7.53 min, which was relatively quicker onset. The mean time to achieve complete motor blockade was 18.9 min in our study. Variation of respiratory rate was studied at different intervals of time along with the pain scores. Results were compared within the group by applying statistical paired 't' test. In our study mean base line respiratory rate fell from 18/ min to around 15.5 in 30min gradually picking up by 90 min and remained to 18.2 /min, however there was no severe respiratory depression. In our study mean duration of analgesia was 150 min which was significantly higher. In our study 10 patients (10%) developed nausea and pruritus in 17 cases (17%).

CONCLUSION: The postoperative analgesia was definitely of a longer duration with Fentanyl added to Bupivacaine, with no obvious increase in side effects. Addition of Fentanyl to Bupivacaine increases its efficacy and prolongs duration of analgesia.

BIBLIOGRAPHY:

1. Simpson BP, Park House J. The problems of post-operative pain. Br J Anaesthesia 1961; 33:36.
2. Lt. Col. Y. Bhargav. Postoperative pain relief with Epidural Morphine and Buprenorphine. Indian journal of anaesthesia 1991; 39: 33.
3. Justins DM, Francis D, Houlton PG, Reynolds F. A controlled trial of extradural fentanyl in labour. Br J Anaesth. 1982 Apr; 54(4):409-14.
4. Coda BA, Brown MC, Schaffer R, Donaldson G, Jacobson R, Hautman B, Shen DD: Pharmacology of epidural fentanyl, alfentanyl, and sufentanil in volunteers. Anesthesiology 1994; 81:1149-61.
5. Grass JA. Fentanyl: clinical use as postoperative analgesic--epidural/intrathecal route. J Pain Symptom Manage. 1992 Oct; 7(7):419-30.
6. SA Lytle, DM Goldsmith, TL Neuendorf, and ME Lowry Postoperative analgesia with epidural fentanyl. Journal of the American Osteopathic Association, Vol 91, Issue 6, 547-547 (1991).
7. Bromage PR. The price of Intraspinal narcotic analgesia: Basic Constraints (Editorial). Anesth Analg 1981; 60: 461-3.

ORIGINAL ARTICLE

AUTHORS:

1. Balasubramanyam Vallem
2. Radha Juvvala
3. Aneela Satya Ravanam
4. Srikanth Reddy Challapalli
5. Sujana Thalamati
6. Saisurej Karranaga

PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Anaesthesia, S. V. Medical College, Tirupati, Andhra Pradesh.
2. Associate Professor, Department of Anaesthesia, S. V. Medical College, Tirupati, Andhra Pradesh.
3. Junior Resident, Department of Anaesthesia, S. V. Medical College, Tirupati, Andhra Pradesh.
4. Assistant Professor, Department of General Surgery, S. V. Medical College, Tirupati, Andhra Pradesh.

5. Assistant Professor, Department of Obstetrics and Gynaecology, S. V. Medical College, Tirupati, Andhra Pradesh.
6. Junior Resident, Department of Anaesthesia, S. V. Medical College, Tirupati, Andhra Pradesh.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Balasubramanyam Vallem,
Assistant Professor,
Department of Anaesthesia,
S. V. Medical College, Tirupati,
Andhra Pradesh – 517507.
E-mail: balasubramanyamvallem@gmail.com

Date of Submission: 17/04/2015.
Date of Peer Review: 18/04/2015.
Date of Acceptance: 22/04/2015.
Date of Publishing: 24/04/2015.