Original Article

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Effects of Epidural Dexamethasone for Post-Operative Analgesia in Patients Undergoing Abdominal Hysterectomy

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Abstract

Background: Slow pain is also known as burning pain, aching pain, and throbbing pain or noxious pain. It is transmitted by unmyelinated type C fibres at a velocity of0.5-2m/sec. The threshold for stimulation is higher than Aδfibres and is responsible for more delayed burning pain. It is usually associated with tissue destruction and can lead to prolonged unbearable suffering. **Subjects and Methods:** 60 ASA 2and 3 patients of age group 45-60 years, scheduled for total abdominal hysterectomy for premenopausal bleeding. Patients were excluded if they had a history of peptic ulcer diseases, had contraindication to epidural anaesthesia(back fusion,coagulopathy,local infection) or failure to achieve epidural analgesia. Patients were also excluded if they were obese, diabetic, had received corticosteroids or immunosuppressive drugs in the last 6 months or if they had contraindication to corticosteroids. **Results:** This study revealed that addition of 8 mg dexamethasone to epidural bupivacaine pre-operatively to patients undergoing laproscopichystrectomy is more efficient t. All the dexamethasone groups achieve better results than the control Group D0 (Max VAS 6, 0% decrease in analgesic requirements, all patients required post-operative analgesia, low patient satisfaction Score 6.7 ± 0.75. **Conclusion:** No difference in post-operative glucose levels between the control group and all dexamethasone groups.

Keywords: Epidural Dexamethasone, Post-Operative Analgesia, Abdominal Hysterectomy.

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Introduction

Pain is a protective mechanism of the body .It occurs whenever any tissues are being damaged and cause the individual to react to improve the painful stimulus .Thus pain may be defensive, protective and diagnostic.

Pain, as a sensation is a function of nerve impulses that ascend from the Periphery and are modulated by mechanisms to appreciate and then evoke appropriate reaction.

Fast pain is also known as sharp pain, pricking pain, acute pain and electrical Pain. It occurs within 0.1 seconds when a painful stimulus is applied. They are transmitted via peripheral nerves to spinal cord by small myelinated type A delta fibres at a velocity between 6-30 m/sec .It is not felt in almost any deep tissue or organ.[1]

Slow pain is also known as burning pain, aching pain, and throbbing pain or noxious pain. It is transmitted by unmyelinated type C fibres at a velocity of0.5-2m/sec. The threshold for stimulation is higher than Aδfibres and is responsible for more delayed burning pain. It is usually associated with tissue destruction and can lead to prolonged unbearable suffering.

There is considerable overlap in activation of Aδ and C fibres. It can occur both in the skin and almost any deep tissue and organ. This pain begins slowly after one second or more and then increases slowly over many seconds and minutes.

These are the peripheral plexus of un-myelinated free nerve endings.They are widespread in superficial layers of skin where receptor field overlap each other, certain internal tissues such as periosteal, arterial wall Joint surfaces, tentorium of cranial vault.These receptors are excited by thermal, chemical, mechanical and electrical stimuli.

These are chemicals, which are synthesized in the nerve terminal and act upon Specific receptors .Example: bradykinine, Serotonin, Histamine, Potassium ions, acids, acetylcholine and protiolytic enzymes, prostaglandins enhances sensitivity of pain nerve endings.[2]

Pain is a complex, subjective personal experience. The assessment of pain is the essential prerequisite for successful pain management. It is useful to decide the plan of initial treatment but also to reassess the degree of success. This cycle of treatment and reassessment is continued until there is successful outcome.

In the immediate postoperative period, physiological responses such as pulse rate, blood pressure, respiratory rate are important indicators of pain.

Analgesia is one of the prime demands of patients post operatively. Various adjuvant are used in regional

anaesthesia to enhance and prolong local anaesthetic analgesia and reduce opioid requirements and there side effects.

However, opioids are known to cause adverse effects such as pruritus, PONV, urinary retention and respiratory depression. Dexamethasone is a highly potent, long-acting glucocorticoid with little mineralocorticoid effect that has been used for prophylaxis of post operative nausea. Single doses of dexamethasone and other glucocorticoids have also been reported to improve analgesia after various operations.[3]

This study was done to evaluate the effect of 8mg of epidural dexamethasone for post-operative analgesia in patients undergoing laparoscopic abdominal hysterectomy.

Subjects and Methods

It was a Prospective randomized, double-blind study

60 ASA 2and 3 patients of age group 45-60 years, scheduled for total abdominal hysterectomy for premenopausal bleeding. Patients were excluded if they had a history of peptic ulcer diseases, had contraindication to epidural anaesthesia(back fusion,coagulopathy,local infection) or failure to achieve epidural analgesia. Patients were also excluded if they were obese, diabetic, had received corticosteroids or immunosuppressive drugs in the last 6 months or if they had contraindication to corticosteroids.

Patients were randomized into two groups by using closed-envelope technique.

Group 1: (study group) received a single shot of 10ml epidural plain bupivacaine (0.25%).containing 8mg dexamethasone.

Group 2: (control group) received a single shot of 10ml epidural plain bupivacaine (0.25%) without any additives.

After obtaining written informed consent, patients who satisfied the inclusion criteria were assessed by a pre anesthetic evaluation, pre medicated with alprazolam 0.5mg HS orally the previous day of surgery.

Intra operatively intravenous line was secured with 18 gauge cannula.

All patients were preloaded with Ringer's lactate solution 10 ml/kg infused IV before initiation of Epidural anesthesia.

Epidural anesthesia with loss of resistance technique was employed at L2-3 level using 18-gauge Tuohy epidural needle. A test dose of 3ml lidocaine 2% with adrenaline 1;2000,000 was used to exclude both subarachnoid and intravascular injection. Patients were randomly allocated on treatment analysis approach into two groups using closed envelope method.

Patients received a single shot of 10ml epidural pain bupivacaine(0.25%) (group D0) The other group received 10 ml epidural plain bupivacaine(0,25%)containing 8mg dexamethasone All study group given equal volume of10ml so that the pateint,anesthesiologist and observers collecting data were blinded to the drug and dose.

General anesthesia was induced by I.V Fentanyl 1microgram/kf .propofol 2mg/kg and atracurium ,1mg/kg. The patients lungs were then mechanically ventilated with 30% o oxygen, in the air and isoflorane(0,7-1%) end tidal concentration to maintain normocarbia at end tidal CO2 between 35 and 40mmhg. All hysterectomies were performed by laparoscopicaly.

A clinical response to intraoperative surgical stimulation was defined as an increase in HR and MAP of 30% of baseline values after induction and was treated with fentanyl 0.5 microgram/kg IV bolus in post anesthesia care unit sedation score was assed on a four categorical scale as 0,alert and aware, 1,drowsy,not sleeping,2,asleep,arousable by verbal contact, and 3, asleep not reusable by verbal contacts. Quality of analgesia was measured by visual analog score (VAS) on a 0-10 cm scale where a Score of 0 represent no pain and 10 is the worst pain imanigeble.VAS was measured every hour up to 6 h postoperatively and then at 6 h interval for 24 h. Whenever score was 4 or the patient requested pain medication analgesia was provided by injection diclo. Satisfaction score was measured on a linear numerical scale ranging 0 complete dissatisfaction to 10=complete satisfaction,

Any post operative side effects for example nausea .vomiting itching bradycardia hypotension excessive sedation inadequate analgesia retention of urine or respiratory depression were recorded.

The procedure was done by another anesthetist unaware of the drug in order to maintain the double blind.

Inclusion criteria

- ASA grade 2 and 3.
- Age 45-60 years. Female patients scheduled for abdominal hysterectomy for premenopausal; bleeding
- Patients willing to participate in the study with a written informed consent taken.

Exclusion criteria

- Any contra-indications to epidural anesthesia.
- Head injury.
- Prior history of peptic ulcer disease ,failure to achieve epidural analgesia.
- Obesity,diabetic.had received corticosteroids or immunosuppressive drugs in the last 6 months or if they had contraindication to corticosteroids.
- Patients on tranquilizers, hypnotics, sedatives and other CNS depressant drugs.
- ASA grade 4.

Results

Table 1: Demographic Characteristics

	Group I	Group II	P value
Age (yrs.)	43.57±8.94	42±9.38	0.5096
Height (cm)	158.4±6.92	159.2±7.29	0.6645
Weight (kg)	58.23±9.68	59.27±6.98	0.6372
ASA Grade 2:3	25:5	26:4	0.7870
Surgical time (min)	89 ± 38.17	102 ± 40.82	0.2077

Table 2: Study Parameters

	Group I	Group II	t value	P value
Time for max sensory level T6 (sec)	544 ±46.43	390.67 ±64.05	10.6161	0.0001
Time for Bromage 3 (sec)	266.67± 44.52	256.67±42.05	0.8944	0.3748
Duration of Analgesia (min)	303.5 ±18.34	209±45.81	10.4894	0.0001
Regression to S1 (min)	336.5 ± 17.77	260.5±25.17	13.5105	0.0001
Regression to Bromage 1 (min)	140± 30.62	144±18.66	0.8864	0.5184

Table 3: Adverse effects

	Group I	Age %	Group II	Age %
Nausea	2/30	6.66	2/30	6.66
Vomiting	1/30	3.33	0/30	0
Pruritus	2/30	6.66	0/30	0
Urinary retention	1/30	3.33	2/30	6.66

Discussion

Epidural dexamethasone in a dose of 8mg was more effective for post-operative analgesia in patients undergoing laparoscopic hystrectomy.

There were no side-effects of dexamethasone usage such as pruritis, retention of urine ,respiratory depression etc.

Single dose of dexamethasone and other glucocorticoids have been reported to improve analgesia after various operations, whether by oralor I.V. routes. epidural dexamethasone is significantly more effective than I.V. dexamethasone to reduce post-operative pain and morphine consumption following laparoscopic cholecystectomy. Some studies revealed that epidural bupivacaine-dexamethasone admixture had almost the same analgesic potency as bupivacaine-fentanyl with opioid sparing and antiemetic effects.

epidural dexamethasone 5 mg pre-operatively in combination with bupivacaine in patients that undergo laparoscopic cholecystectomy. It found to reduce post-operative pain and decrease post-operative morphine consumption in these patients. Khafagy et al., used epidural dexamethasone 4 mg pre-operatively in combination with bupivacaine in patients that undergo lower abdominal surgery (e.g., varicocelectomy, herniorrhaphy), it was found to have the same analgesic potency as bupivacaine-fentanyl combination.[4] Jo et al. used epidural dexamethasone 5 mg in combination with ropivacaine administrated either pre- or post-operatively in patients undergoing radical subtotal gastrectomy. It was found to reduce post-operative pain and analgesic requirements.[5]

This study revealed that addition of 8 mg dexamethasone to epidural bupivacaine pre-operatively to patients undergoing laproscopichystrectomy is more efficient t.All the dexamethasone groups achieve better results than the control Group D0 (Max VAS 6, 0% decrease in analgesic requirements, all patients required post-operative analgesia, low patient satisfaction Score 6.7 ± 0.75. No difference in post-operative glucose levels between the control group and all dexamethasone groups. No patients experienced wound infection or delayed wound healing at follow-up.

Conclusion

From our study, we conclude that 8mg of dexamethasone given epiduraly in laparoscopic hysterectomy cases as adjuvant provides effective post operative analgesia with minimal side effects.

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