WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 11, Issue 13, 2072-2088. Research Article ISSN 2277– 7105

EPIDURAL TRAMADOL FOR POSTOPERATIVE PAIN RELIEF IN GYNAECOLOGICAL SURGERIES

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Article Received on
16 August 2022,
Revised on 05 Sept. 2022,
Accepted on 26 Sept. 2022
DOI: 10.20959/wjpr202213-25755

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ABSTRACT

The study for evaluation of epidural tramadol for postoperative analgesia was conducted in the department of obstetrics & gynecology Dr. V. M. Medical College, Solapur. The study included 48 patients undergoing gynaecological surgeries. In this preliminary study 17 patients received epidural tramadol 50 mg, 14 patients received epidural tramadol 100 mg. 17 patients received 0.25% Bupivacaine 10 cc (control group). Tramadol a synthetic opioid of the aminocyclohexanol group is centrally acting analgesic which acts at opiate receptors and also appears to modify transmission of pain impulses by inhibiton of monamine reuptake and serotonergic neurotransmission, compared with typical opioid agonist such as morphine and pethidine (meperidine) tramadol have a low incidence of respiratory depression and cardiac depression and low dependence potential. The patients were posted for gynaecological surgeries. The patients were given epidural tramadol 50 mg, 100 mg and Bupivacaine 0.25%. The time of injection of drug and onset of analgesia was observed. When epidural tramadol was used on set of analgesia was between 14 to 15 minutes. Onset of analgesia with Bupivacaine 0.25% (control group) was also 14 to 15 minutes. In group 2 the mean duration of pain relief was 7.58+/- 0.69 hrs. which was significantly higher than that of control group ($P<0.001$). The number of doses required in 24 hr. period was less with epidural tramadol 100 mg. The pain scores at 3,6,12, and 24 hrs. were significantly lower in group 2 as compared with group 3($P<0.001$). There was statistically significant difference in duration of analgesia in group 1 and group 3. The pain scores at 3,6,12, and 24 hrs. were significantly less in group 1 than group 3, only one patient 1 required rescue analgesics. It was observed that the duration of the pain relief with epidural tramadol was more than that of

the control group. This was proved by statistically significant difference when these two groups were compared. Pain score observed by visual analogue score were less in tramadol groups than in control groups as proved statistically significant difference between two groups. Respiratory depression was not observed in any of the cases. Cardiovascular parameters were stable in tramadol group. Nausea and vomiting occurred in 25% of cause with tramadol 100 mg and 10% of cases in tramadol 50 mg.

KEYWORDS: Epidural, Tramadol, Bupivacaine.

INTRODUCTION

John Dryden has said: For all the happiness mankind can gain is not pleasure but in relief of pain. Usually after abdominal surgery because of severe pain patient restricts use of thorax and anterior abdominal muscles for almost all vital activities like respiration & coughing, for the fear of aggravating the pain. Fear, pain, anxiety, muscle spasm, all these factors hinder respiration which becomes shallow and because of reflex abdominal spasm the chest is held in expiratory volume.

Thus hypoxemia may follow postoperatively even in healthy patient. This under ventilation and hypoxemia retention of secretions set stage for pulmonary complications. Thus the patient will not be happy unless he or she is comfortable in postoperative period though the surgeon has done his job skillfully.

Pain relief can be obtained by interruption of the nerve pathways or by modifying reaction of brain to these stimuli. The former can be achieved by analgesic drugs. Opiates have therapeutic reliance since antiquity & are still amongst the most widely used drugs for pain relief. However, parental opioid analgesic has gone hand in with respiratory depression, as the blood brain barrier ensured that central respiratory mechanisms & central pain mechanisms received more or less equal shares of whatever opioid was available from blood compartment.

Blood brain barrier is bypassed when opioids are placed in cerebrospinial fluid & entry into neuraxis is then depends upon water & lipid solubility & specific receptor binding also plays a role. Analgesia is segmental as with local anaesthetics but opioide provide pure pain relief as opioid receptors are confined to synaptic junctions in the small cell networks of laminae 1 & 2 of dorsal horn. Pain relief is remarkably prolonged when a poorely lipid soluble drug

such as morphine is used. However intraspinal epidural opioids are associated with side effects such as pruritus. Urinary retention, respiratory & cardiovascular depression. Vomiting, which are dose dependent & patients who receive postoperative monitoring.

Tramadol is new synthetic opioid without respiratory depression when used parentrally. Preliminary reports have shown that epidural tramadol can provide postoperative analgesia without any side effects.

History and review of literature

Corning in 1885 first performed peridural anesthesia with Cocaine for relief of pain in an extremity. Cathlin in 1895 first used epidural analgesia in sacral regine, now called as caudal analgesia.

Lown in 1910 investigated anatomy of spinal and epidural area he found that injection into sacral canal didn't reach the subarachnoid space.

Poges (1921) was the first to describe practical application of lumber epidural analgesia.

Wang et al 13 studied eight patients who had severe intractable pain in the back & legs, secondary to malignancy of genitourinary tract with invasion of lumbosacral plexus were selected for study. All patients reported complete pain relief ranging upto 15 -18 hours as compared with control.

Rawal et al in 1981 studied 280 cases. Excellent analgesia was noted in 87 % of patients with 2 to 4 mg morphine postoperatively. The pain relief was for entire postoperative period in 30 % cases, in remaining cases {10} there was average duration of analgesis. In this study Rawal et al noted no significant postoperative respiratory depression. Absense of sedation, orthosratic hypotension, motar paralysis facilitated early ambulation & less respiratory complications in this study.

Rawal et el also noted elderly and frail patients were sensitive morphine & prone for delayed respiratory depression.

Bromage (1981) in this editorial reviewed the advantage and disadvantage off spinal & epidural opioids. Pruritus, nausea & vomiting. urinary retention respiratory & cardiovascular depression were the side effects discussed. Bromage concluded that.

1} Intensity of analgesia & incidence of side effects both are dose dependant.
2} Lipid insoluble drugs are more likely to cause delayed respiratory and cardiovascular depression than lipid soluble drugs.
3} The patient who is receiving epidural opioids should not be kept in a single bedded private room as postoperative monitoring as far as respiratory & cardiovascular depression are concerned is very much necessary.

M.D. Vickers (1992) et al conducted two clinical trials simeltaneusly. In one, tramadol & pethidine were compared in 30 patients by patient controlled analgesia during first 24 hr following abdominal surgery. The mean 24 hr. consumption of tramadol & pathidine was 642 mg & respectively giving potency factor of tramadol relative to that of pethidine. In the second trial effect of three doses of tramadol (0.5, 1,2 MgKg-1) on respiration was compared with that of morphine sulphate (0.143 MgKg-1) by intravenous 1.5 times equipotent dose. as estimated from first trial, tramadol transiently depressed the rate of respiration but had no effect on endtidal CO2 tension. Morphine caused apnea or considerable depression of ventilation. The results suggested that mechanisms other than opioid receptor activity may play a significant role in tramadol analgesis.

Anis Baraka et al (1993) compared epidural tramadol with epidural morphine in 20 patients undergoing major abdominal surgery. Intraoperatively patients were anaesthetized by a balanced anaesthesia technique of general anaesthesia combined with lumber epidural lidocaine. In 10 of the patients epidural tramadol 100 mg diluted in 10 ml of normal saline was also injected epidurally while 4 mg of epidural morphine was used in other 10 patients. In all patients the visual analogue pain score, PaO2 PaCo2 and respiratory rate were monitered every hour for the first 24 hr postoperatively. In both the tramadol & morphine groups the mean hourly pain scores ranged from 0.2 +/-0.6 to 1.4 +/-2.5 throughout the period of observatively in the epidural tramadol group.

Robert Jan M. Houmes et al in 1992 studied efficacy & safety of tramadol verses morphine for moderate & severe postoperative pain with special regard to respiratory depression, in a double bling randomized study of 150 female patients after gynaecological surgery. As required patients could receive upto three intravenous doses of either 50 mg of tramadol or 5 mg of morphine within a period of 6 hrs. Pain intensity (verbal response score) was recorded before injection and at 0.5, 1,2,3 5 & 6 hr. after initial dose, at these times pain relief was also

assessed. Oxygen saturation was monitored continuously by pulse oximetry for at least 30 min after each injection.

In 13.3 % of morphine group (but in none of tramadol group) transcutaneous pulse oxygen saturation. decreased to less than 86% in 50 % of these patients the decrease occurred only after first 5 mg of morphine. Both drugs produced acceptable analgesic and there suggesting that hypoxemia rather than hypercarbia or decreased respiratory rate may be an earlier indicator of respiratory depression in patients breathing room air without oxygen supplementation.

A.E. Delikan, R. Vijayan et al (1993) studied the efficacy of epidurally administrated tramadol. Sixty patients undergoing abdominal surgery were randomly allocated to three treatment groups to be given the following agents by epidural route: group 1: tramadol 50 mg. groups 2: tramadol 100 mg group 3:10 ml of bupivacaine 0.25 % The drugs were administered at the patients request with each patient being allowed four doses in the first 24 hr. Following surgery. Blood pressure, respiratory rate, arterial blood gas analyses, pain scores, the interval between doses and the occurrence of any side effects were recorded. Pain scores (assessed using a visual analogue scale) were significantly less (P<O. 05) at 3,12 & 24 hr. in patients receiving tramadol 100 mg than in those receiving tramadol 50 mg or bupivacaine.

AIMS AND OBJECTIVES

The present study of epidural tramadol for postoperative pain relief was carried out in the Department of Obstetrics and Gynecology Dr.V.M. Medical College & General Hospital, Solapur.

The goals of study were.

1 . To evaluate the efficacy of tramadol through epidural route for postoperative pain relief.

2. To achieve analgesia with no significant respiratory depression as encountered with morphine when given epidurally.

3. To achieve postoperative analgesia without nausea, vomiting & postoperative urinary retention as encountered with epidural morphine.

4. To compare analgesic effects of epidural tramadol with bupivaicaine used as a control.

Pharmacology of tramadol and bupivacaine

Assessment of postoperative pain

Psychology of pain is an important factor for assessment of pain. Occasionally patient may not require analgesia at all even after a major surgery. At the other extreme inspite of adequate analgesia, complaint of pain persists. Psychological approaches may be utilized to assess the susceptibility of an individual to acute pain and also a part of rational therapy (young M.L.Kittz D.S. Postoperative mood assessment in surgical patients.impact of vomiting & pain. Anesthesiology, 75, A6, 1991. Mary L. Steowart, Psychophysiology of pain Drugs 33, (suppl, 1)16-27 (1987)

Phamacology of Tramadol

Tramadol is centrally acting analgesic which possesses opioid agonistic properties and activates monoaminergic spinal inhibition of pain.

Tramadol is a synthetic opioid & belongs to aminocyclohexanol group. It is a centrally acting analgesic with opioid agonistic properties and effects on noradrenergic & serotonergic neuro transmission.

1) Analgesic Activity

Dose dependent analgesic activity of tramadol has been demonstrated in mice & rats using various tests of analgesia including tail flick response, vocalization threshold to paw pressure, hot plate & abdominal constriction. Peak analgesic effect occurred 3-4 hour after tramadol administration & analgesia persisted for 6 hours.

2) Respiratory system

Opioid analgesics cause respiratory depression by decreasing sensitivity of respiratory centre to Co2 Which result in decrease in respiratory rate & tidal volume & may cause increase in alveolar CO2.Tramadol produces less respiratory depression than morphine in therapeutic doses. However respiratory depression may occur if recommended dose is considerably exceeded.

3) Haemodynamic effects

Intravenous tramadol causes an increase in heart rate. & increase in systolic & diastolic blood pressure 5 to 8 minutes after intravenous administration.

4) Tolerance & Dependence potential

Tolerance to analgesic effects of tramadol is minimal & less than that produced by morphine. Tramadol has low dependence potential.

5) Other effects

= Tramadol dose not increase baseline pressure, frequency and amplitude of contraction of bile duct sphincter.

= It has slight relaxant. Central depressant effect.

= It dose not release histamine.

= It stops post anesthetic shivering.

Mechanism of Action

The periaqueductal grey region, the medullary raphe & the dorsal horn of spinal cord, all contain a high density endogenous opioid peptides and opiate receptors The mechanism by which opioid analgesics inhibit pain perception involves in part activation of both the descending serotogenic & noradrenergic pathways.

Alpha - 2 receptor blocker yohimbine & serotonin antagonist ritanserin significantly reduce the analgesic action of intrathecally administered tramadol, indicating that both noradrenalin & serotonin are inhibits the uptake of serotonin and induces it's realase in cortex. It blocks the uptake of noradrenline. Both noradrenline & serotoin play either a direct or modulatory role in tramadol analgesia.

Pharmacokinetic properties

Mean oral availability of tramadol after single dose is 68% which is higher than morphine, pethidine or pentacocine all of which tend to have low & variable bioavailability. The mean absolute bioavailability after intramuscular administration is 100% & after rectal administration 78% Tramadol is rapidly distributed after intravenous administration, with a distribution half life in initial phase of 6 minutes followed by a slower distribution phase with a half life of 1.7 hours.

Tramadolcrosses the placenta with serum concentrations in umbilical veins 80% of those in maternal veins.

Metabolism

Metabolized by liver & excreted via kidneys. Tramadol undergoes biotransformation in the liver by two main metabolic pathways to from the N & O- demethylated compounds (Phase I reactions) The o- demethylated metabolites are further conjugated (phase II reactions). Five metabolites arising from phase I reactions & 6 from phase II reactions are known.

The main metabolites are o – demethy tramodol & it's conjugates. di-v-o methyl tramadol. The o- demethyl tramadol metabolite (MI) has been shown to have analgesic activity in animal experiments with 2-4 times potency of tramadol. In receptor binding M1 has 4 times to 200 times greater affinity for mu opioid receptor. None of the other 10 metabolites are pharmacologically active.

Following oral administration, 90 % is excreted via kidneys & remaining 10 % appears in faeces 16% & 13% tramadol gets excreted unchanged through kidneys & remaining is metabolized. 0.1 % of tramadol is excreted in milk of lactating women.

Uses

Management of acute pain

Tramadol is effective after intramuscular intravenous and epidural routes. Advantages of tramadol are negligible respiratory depressant activity and minor side effects. Patient controlled analgesia with tramadol is well accepted by patients. Tramadol has also been used for the control of pain associated with labour and acute myocardial infraction as well as for management of trauma.

Side effects

1) CNS effects - Dizziness trembling, Sedation, Euphoria, Dysphoria
2) Gastrointestinal – Nausea, vomiting, Gastric irritation
3) Autonomic – Dry mouth, sweating
4) Cardiovascular – Orthostatic dysregulation & tachycardia
5) Other – Dermal/Allergic

Dose and administration

Adults and children above 14 years of age-100 mg intramuscular or subcutaneous or intravenous to be injected slowly or diluted in solution for infusion. It is also effective orally.

Maximum dose per day is 400 mg.

Children above 1 year and upto 14 years of age- 0.75 – 1.0mg/kg.

Chemistry

Chemically it is (DL) -1-butyl. 1-2 piperidine hydrochloride It produces sensory block much more efficiently than motor block. It's long acting, more lipophilic, more protein bound. It's used commonly in lumber epidural for painless labour as it has less motor blocking property. It crosses placenta in very less amounts. Tachyphylaxis is less with bupivaicaine & it has longer duration of action.

Concentrations of 0.125 % to 0.5 % may be used for epidural analgesia. However with concentration of 0.125 % there are very high failure rates. 0.25 % gives predictable analgesia without motor block.

MATERIAL AND METHODS

The present study was carried out to evaluate the efficacy of epidural tramadol for postoperative pain relief in various surgical procedures. General anaesthesia & lumbar epidural anaesthesia were the anaesthetic techniques used in these patients. These cases were followed up in postoperative period. for assessment of efficacy of tramadol through epidural route. Patients with epidural Bupivacain for postoperative analgesia were taken as control.

Selection of patients

1) The study comprised of 48 patients who were to undergo planned gynaecological surgeries.

2) Those patients excluded were: Pregnant & lactating mothers, those on MAO inhibitors, mentally retarded and those taking drugs acting on CNS.

3) Those patients having abnormal spine, skin infection were excluded from this study.

Preoperative Evalution

1) Patients history was taken - Patients were examined clinically with respect to, General examination, local examination of spine, Cardiovascular system, Respiratory system , Central nervous system.

2) Investigations – HB percentage, Bleeding time, Clotting time, Urine for albumin & sugar, ECG - Chest X- ray - if indicated.

3) Procedure was explained to patient & informs consent was obtained.

4) Patients were than randomly allocated in three groups

Group 1 : tramadol 50 mg,

Group 2 : Tramadol 100 mg

Group 3 : Bupivacaine 0.25 % (10 ml)

5) In all patients an epidural catheter was inserted in L1 L2 interspace under all aseptic precautions.

Postoperative Analgesia

Postoperative orders in each patients were.

W/F pulse /BP ½ hrly, No sedatives/ analgesics

Call anesthesiologist when – patient complains of pain, Respiratory difficulties and Fall in BP bellow 90 mm of Hg.

First assessment was done when patient required or requested for analgesia. Prior to the administration of drug, pulse, blood pressure, respiratory rate were noted. Drugs were prepared in 10 ml volume. 50 % 100 mg tramadol in 10 cc of normal saline & 10 ml of Bupivacaine 0.25 % Time was noted during every dose. If satisfactory analgesia not achieved within 15 min (i.e. decrease in pain score by half or patient says she still has lot of pain) the second dose was given epidurally. If the second dose couldn't give adequate pain relief was removed from trial.

Pain scores were recorded when patient requested for analgesia (at " 0 " hrs)

and at 1^{st} , 3^{rd}, 6^{th}, 12^{th}, & 24^{th} hr. after patients was given 1^{st} dose of drug epidurally.

Total 4 doses of drug were given in 24 hour period.

Mean duration of pain relief. Side effects also recorded in each case.

Number of doses required in 24 hrs. were recorded.

OBSERVATIONS AND RESULTS

Our study included 48 patients of ASA grade I & II undergoing major gynaecological operations. The study was conducted in Department of obstetrics and gynaecology Dr. V. M. Medical college, solapur.

All patients were divided randomly in three groups.

Groups 1 – 17 patients received tramadol 50 mg in 10 ml of normal saline.

Groups 2 – 14 patients received tramadol 100 g in 10 ml of normal saline.

Groups 3 – 17 patients received 0.25 % Bupivacaine 10cc.

Pain intensity was assessed by visual analogue scale. Pain scores were recorded as follows

0	2.5	5	7.5	10
No Pain	Mild	Mod	Severe	Pain as bad asit could be.

Table 1: Patient Data: Results are expressed as mean (SD).

	Group 1 (Tramadol 50 mg) n = 17	Group 2 (Tramadol 100 mg) n = 14	Group 3 (Bupivacaine 0.25 %) n = 17
Age (years)	36.2 +/-(9.84)	41.9+/-(8.04)	38.63+/-(10.9)
Weight (kg)	55.55 +/-(4.71)	57.7+/-(6.32)	55.53+/-(7.31)

When we compare group I & III and group II & III with respect to age & weight, the difference is nonsignificant. Hence the three groups are comparable.

Table 2: Types of surgery.

Types of surgery	Group1 (Tramadol 50 mg) (n = 17)	Groups 2 (Tramadol 100mg) (n = 14)	Group 3 (Bupivacaine 0.25 % (n = 17)
Abdominal hysterectomy	8		8
vaginal hysterectomy	7	10	5
Fothergill's repair		4	3
Wertheim's hysterectomy	1		1
Shirodkar's repair	1		

Frequency of doses & mean duration of pain relief.

Patients given tramadol 100 mg required fewer doses when compared with Bupivacaine & tramadol 50 mg groups. No patient in group 2 (tramadol 100 mg) required rescue analgesic where as patients in group 3 and group 1. patient in group required rescue analgesics.

The number of doses given in each group and mean interval between the doses summarized in table 3.

There was a significant difference in group 2 (tramadol 100 mg) & group 3 (Bupivacaine 0.25). (P<O.001 for group 1 & II; P<O.OO1 for group II & III).

Table 3.

No of doses	Group 1 n = 17	Group 2 n = 14	Group 3 n = 17
Four doses Three doses Two doses One doses	 14 3	0 11 2 1	14 2 1 -
Mean duration (SD) of dose (hrs)	4.13+/-(0.50)	7.58+/-(0.69)	3.06 +/-(1.04)
No of patients given rescue analgesics	1	-	9

Visual Analogue Scores

The three groups had similar pain scores when the patients requested for analgesia (at "0" hr) prior to the administration of the trial drug. The degree of analgesia was better with tramadol 100 mg with significantly lower pain scores at 3,6,12 & 24 hrs when compared with bupivacaine 0.25 %.

Table 4: Visual analogue scores results are expressed as mean (SD).

	Group 1	Group 2	Group 3
Immediate postop Dose ("0 " hr)	7.37+/-(0.32)	7.25+/(0.34)	7.36+/-(0.28)
1 h	3.1 +/-(0.26)	2.95 +/-(0.48)	3.26 +/-(0.45)
3 h	3.2 +/-(0.38)	2.53 +/-(0.34)	3.84+/-(0.50)
6 h	3.15+/- (0.43)	2.47+/- (0.34)	3.58 +/- (0.51)
12 h	3.1 +/-(0.31)	2.27 +/-(0.41)	3.57 +/-(0.51)
24 h	3.13 +/-(0.46)	2.2 +/-(0.47)	3.73 +/-(0.56)

When group 1 & 3 are compared at 1 & 3 hrs P>0.05; hence nonsignificant. However there is significant difference (P< 0.001) at 3,6,12 & 24 hrs in visual analogue scores. When group 2 & 3 are compared at 1 & 3 hrs.(P>0.005) the difference between visual analogue pain scores is nonsignificant. At 3,6,12 & 24 hrs there is significant difference (P<0. 001) between group 2 & 3 in visual analogue pain scores.

DISCUSSION

The present study was conducted in 47 patients who were planned for gynaeclogical surgeries. This study was planned to evaluate efficacy of epidural tramadol when compared with control (0. 25% Bupivacaine) We evaluated epidural tramadol for postoperative analgesia. It's mean duration of pain relief, frequency of doses in 24 hrs. (maximum 4 doses

were allowed), pain scores and side effects such as nausea & vomiting, respiratory depression, retention of urine & hypotension.

If a method of analgesia is to be successful & available to large number of patients it must be suitable for use in general surgical ward & should require only simple routine nurse monitoring.

The nonavailibility of monitoring facilities in public hospital like ours necessitates study of epidural tramadol for postoperative analgesia.

Tramadol is a centrally acting analgesic which acts on opioid receptors and also appears to modify transmission of pain impulses by inhibition of manoamine uptake. The duration of analgesia with orally administered tramadol was 3 to 6 hours. with maximum pain relief reported at 1 to 4 hr. postdose. Intravenous tramadol 2 mg. / kg was as effective as pethdine 1 mg / kg. Tramadol inhibited the uptake of serotonin into purified rat formal cortex synaptosomes and induced release of this neurotransmitter in frontal cortal slices. The latter action being blocked by 6- nitroquipazine. There is also a noradrenergic component in the analgesic action of tramadol. (Drugs 46/23, 1993) It appears that both noradrenaline & serotonin play either direct or modulatory role in tramadol analgesia.

No patients in group 2 (tramadol 100 mg) failed to obtain analgesia. Tramadol 100 mg patients required fewer doses and each dose gave a longer duration of pain relief than bupivacaine 0.25% (control) Mean duration of pain relief for tramadol 100mg patients was 7.58 +-0.69 hrs. and that for Bupivacaine was 3.04 +/-1.04 hrs. The mean duration of pain relief was significantly higher in tramadol 100 mg than in bupivacaine 0.25% (control group) ($P<0.001$)

The pain scores on visual analogue scale were significantly less ($P < 0.01$) in tramadol 100 mg at 3,6,12 & 24 hrs. than bupivacaine 0.25% (control group). It shows that tramadol 100 mg produced a better quality of pain relief than bupivacaines 0.25% 9 (control group).

Group 1 patients (Tramadol 50 mg) also has a good pain relief with epidural tramadol 50 mg than control group. One patient in this group required rescue analgesic that patient might have be needed 100 mg of tramadol epidurally. Mean duration of pain relief was significantly more ($P<0.01$) in tramadol 50 mg group than bupivacaine 0.25 %. Also pain scores were less in tramadol 50 mg group than in bupivacaine 0.25 % at 3,6,12 & 24 hrs.

In this preliminary study we did not compared tramadol 50 mg with tramadol 100 mg (we had bupivacaine 0.25 % as a control group). However the quality of analgesia was better with tramadol 100 mg.

In contrast to tramadol 50 & 100 mg. in group 3, there were higher pain scores at 1,3,6,12 & 24 hrs. Mean duration of pain relief was less and frequency of doses were more. Respiratory depression was not seen in any of the patients.

No patient in any group reported pruritus. However one patient in group 2 reported burning sensation all over body after topup dose. However she needed only reassurance as cardiovascular parameters were stable.

The incidence of nausea and vomiting was 25 % in group 2 as compared to 10 % in group 1. An antiemetic should be routinely administered to control any nausea & vomiting. The incidence of nausea & vomiting in our study was less than in other studies. (Delikan & Vijayan 1992). Only patient in group 3 reported nausea & vomiting.

Cardiovascular parameters after administration of epidural tramadol were stable. The observed transient drop in systolic blood pressure (one patient in group 2 & no patient in group 1) could have been due to reduction in vascular tone following adequate analgesia or tramadol group, in 2 patients in group 3 (Bupivacaine 0.25 %) hypotension was observed. numbness and shivering was observed in 2 and 1 patients respectively in group 3. These are the known complications (side effects) of local anesthetic injections in epidural space Retention of urine was observed in one case in group 2 However it was impossible to detect any retention due to direct effect of trial drug because many patients in the study had indwelling urinary catheter in the postoperative period as a part of surgical management. Transient double vision can occur with epidural administration of tramadol (Delikn, Vijayan 1993) however it was not observed in our study in any of the cases.

Thus, tramadol given epidurally can safely be used in general surgical ward provided the blood pressure can be recorded regularly following a topup dose. It provides effective postoperative analgesia. It has advantage that, it is not a controlled drug and it's available in preservative free form. It does not cause respiratory depression & it's a cardiovascular stable drug. It has no addiction liability. Onset of analgesia is quick & analgesia is of prolonged duration.

Thus tramadol is a safe alternative to established opioids for epidural administration, especially when preservative free morphine / pethidine is not available or when there is a pre-existing respiratory compromise. From our study we can recommend an initial dose of tramadol 100 mg in 10 ml of normal saline. A maximum 400 mg in 24 hr. is recommended because of it's analgesic celing effect and side effects like sweating nausea & vomiting that may occur.

CONCLUSION

48 patients undergoing gynaecological surgeries were studied to evaluate the efficiency of tramadol through epidural route to provide postoperative analgesia. The present study was conducted at the Department of obstetrics & Gynecology Dr. V.M. Medical college, Solapur. It can be concluded from the present study that.

1) Epidural tramadol provided excellent analgesia in postoperative period. The mean duration of action of tramadol 100 mg through epidural route was 7.58(+/- 0.69) in our study and that of epidural tramadol 50 mg was 4.13 (+/- 0.50) hrs. Onset of analgesia was fast and duration of complete analgesia was long enough to obviate frequent top up doses.
2) Epidural tramadol proved to provide better analgesia than Bupavacaine 0.25% (control group). Pain scores were significantly lower in postoperative period in tramadol group than in the control group.
3) Epidural tramadol was free from side effects such as respiratory depression, numbness in lower limbs, retention of urine and hypotension.
4) Nausea and vomiting were major side effects observed with epidural tramadol 100 mg.
5) There was no intention of drug intolerance, effect on psychomotor function, in patients who received epidural tramadol.
6) Epidural tramadol didn't require special monitoring except blood pressure recording after top up doses, as it's free from respiratory depression.

Thus, epidural tramadol can be used as a reliable analgesic to provide postoperative analgesia in surgical wards. It provides excellent analgesia which is prolonged. The drug is free from any side effects which may require monitoring. Epidural administration of tramadol would be useful addition in anaesthetics armamentarium.

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