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Preemptive Analgesic Effects of 1 Gm Paracetamol Infusion on The Total Requirement of Tramadol In The Postoperative Period Including Rescue Analgesia.

Dr Manmohan Jindal[1], Dr Rishabh Khandelwal[2], Dr Neeraj Narang[3], Dr.Rekha Mahendra[4]

Dr Manmohan Jindal[1], Associate Professor, Department of Anaesthesia, Geetanjali Medical College, Udaipur

Dr Rishabh Khandelwal[2], Consultant, Solanki Hospital, Alwar

Dr Neeraj Narang[3], Assistant Professor, Department of Anaesthesia, NSCB Medical College, Jabalpur

Dr. Rekha Mahendra[4], Ex -Professor & HOD, Department of Anaesthesia, NSCB Medical College, Jabalpur

Corresponding Author: Dr Rishabh Khandelwal, Consultant, Solanki Hospital, Alwar.

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Abstract

Introduction: Most common symptoms which follow anaesthesia and surgery are pain and emesis. Pain relief after surgical procedures continues to be a major medical challenge.

Aims and Objective : To study preemptive analgesic effects of 1 gm paracetamol infusion on the total requirement of tramadol in the postoperative period including rescue analgesia.

Material and Method: The present study is under taken in indoor patients admitted in N.S.C.B. Medical College Jabalpur. Patients divided into 3 group I, II and III. Each group includes 30 patients of different ages.

Group (I): IV paracetamol infusion 1gm given for 15-20 minutes, 30 minutes prior to induction.

Group (II): IV paracetamol infusion 1 gm given for 15-20 minutes prior to skin closure.

Group (III) : serve as a control group and receive normal saline as placebo.

Postoperatively pain scores, sedation scores, postoperative tramadol doses, side effects were recorded.

Result: Sixty patients were involved in the study. When the demographic data and operation values of the 60 patients included in the study were compared, no statistically significant differences were determined between groups.

Keywords: Preemptive Analgesia, Paracetamol, Tramadol.

Introduction

Most commen symptoms which follow anaesthesia and surgery are pain and emesis. Pain relief after surgical procedures continues to be a major medical challenge. The alleviation of pain is given a high priority by the medical profession and health authorities.Three reasons for the under treatment of pain relate to fear of narcotic addiction, poor communication among staff and perceptions by patients that medications for pain are neither necessary nor good[1.]

preemptive analgesia is an antinociceptive treatment that prevents establishment of altered processing of afferent input, which amplifies postoperative pain.[2] The proposal is that the effect of the pre-emptive analgesia is to prevent

or reduce the development of any " memory of the pain stimulus in the nervous system, and that the lesser subsequent analgesic requirement is a result of this prevention or reduction of the pain memory. There is both scientific and clinical interest in this effect. The scientific interest is in the mechanism underlying the effect; the clinical interest is in the potential for improving postoperative pain management.[3]

Preemptive analgesia give rise to a subsiding pain pattern, a decrease in analgesic requirements, and a decline in morbidity, promoting wellness and shortening the length of hospital stays.[4] Local anesthetics, opioids, non steroid anti-inflammatory drugs (NSAIDs) and acetaminophen group drugs can be delivered either alone or in combination for preemptive analgesia.[4] In our study we take 1 gm iv paracetamol infusion as preemptive agent and assesed postoperative tramadol consumption, sedation and pain scores, side effects, patient satisfaction in elective abdominal surgery patients , who received intravenous (IV) paracetamol infusion 1g either preoperatively or intra operatively, and to compare the results with control patients who received placebo.

Aims and Objective

To study preemptive analgesic effects of 1 gm paracetamol infusion on the total requirement of tramadol in the postoperative period including rescue analgesia

Material and methods

The present study is under taken in indoor patients admitted in N.S.C.B. Medical College Jabalpur.

Selection of Cases:

After obtaining institutional and ethics committee approval an informed written consent is taken from all 90 patients of ASA class I, II which includes adult patients of age group (20-60 years) undergoing elective abdominal surgeries.

A detailed history, thorough physical examination, routine investigation or any special investigation if required done for the study.

Criteria for Exclusion:

History of allergic reaction of paracetamol. Any history of usage of paracetamol, opiods, or NSAIDs in the last 48 hours of surgery.

Chronic alcoholism, liver, kidney disease.

Cardiovascular system illness.

Bleeding diathesis.

Any contraindication to tramadol use.

American society of Anesthesiologist (ASA) class III and IV. Design of Study :

Patients divided into 3 group I, II and III. Each group includes 30 patients of different ages.

Group (I): IV paracetamol infusion 1gm given for 15-20 minutes, 30 minutes prior to induction.

Group (II): IV paracetamol infusion 1 gm given for 15-20 minutes prior to skin closure.

Group (III) : serve as a control group and receive normal saline as placebo.

Postoperatively pain scores, sedation scores, postoperative tramadol doses, side effects were recorded.

Techniques:

The patient placed on operation table in supine position. Before starting the procedure all the monitoring equipments (NIBP cuff, pulse oximetry probe, ECG) attached to patient and baseline value of BP, HR, SPO2 and RR recorded. An IV cannula inserted.

Patients age, weight, ASA classification and operation period is recorded. The patients pre-oxygenated for 3 mins with 100% oxygen. Patient induced with IV Propofol 2 mg /Kg and Fentanyl 3 mcg/Kg and then vecuronium 0.12 mg/Kg given. Following intubation maintenance of general anaesthesia accomplished by using halothane and if required vecuronium 0.01 mg/Kg is given. No

additional analgesic given over the entire course of the operation.

- In group I, patients receive 1gm (100ml) infusion of IV paracetamol over 15-20 minutes 30 minutes prior to induction and receive normal saline (100ml) as infusion over 15-20 minutes prior to skin closure.
- In group II, patients receive normal saline (100ml) as infusion over 15-20 minutes 30 minutes prior to induction and receive 1 gm (100ml) IV paracetamol infusion over 15-20 minutes prior to skin closure.
- In group III, patients receive normal saline (100ml) as infusion 15-20 minutes both, 30 minutes prior to induction and also prior to skin closure.
- At the end of the operation all patients transferred to recovery room and as soon as the patient complaints of pain (VAS >4) IV tramadol 100mg given postoperatively to all patients.
- For postoperative pain assessment, VAS is used (VAS: 0-10; 0- no pain, 10- worst pain imaginable).[23]The sedation levels of the patients will be defined in accordance with the modified Ramsey sedation scale.[24]
- VAS scores of the patient in postoperative period at 2hr interval till 24 hours (VAS)is recorded also the modified Ramsey Sedation Score, The total tramadol consumption during the study period of 24 hours is recorded.
- For all patients whenever the VAS score goes above 4 i.e. patient complain of pain after the first dose of IV tramadol (100mg) then repeat doses of IV tramadol 50 mg is given to patients for pain relief and there is a minimum of 4 hour interval between the 2 doses of tramadol.

Rescue analgesia is given using IM diclofenac 75mg if patients complaint of pain i.e. VAS >4 within 4 hours of receiving IV tramadol.

VASpainscore[23]:subjective

0-nopain

10-worst pain

Modified Ramsey Sedation Scale.[24]

1- Anxious, Agitated, Restless

2- Cooperative, Oriented, Tranquil

3- Drowsy but responds to commands only

4- Brisk response to light glabellar tap or loud noise.

5- Sluggish response to light glabellar tap or loud noise

6- Asleep and unarousable

Nausea : (0-no, 1-mild, 2-moderate, 3-severe/requiring t/t)

Pruritus : (0-no, 1-mild, 2-moderate, 3-severe/requiring t/t)

Satisfaction : (0-unsatisfactory, 1-satisfactory, 2-excellent visit).

Result

Sixty patients were involved in the study. When the demographic data and operation values of the 60 patients included in the study were compared, no statistically significant differences were determined between groups.

Table 1 Demographic data

	Group 1	Group 2	Group3
Age (year)	38.5±13.8	38.7±13.3	38.7±11.2
Operation time(min)	98±19.2	98±13.5	107±23.2
Weight(kg)	52.2±7	52.6±8	51.5±8.8

Table 2 Postoperative Tramadol consumption

	Group1	Group2	Group 3
Total tramadol consumption	118.73±24.50	135±23.30	163.33±

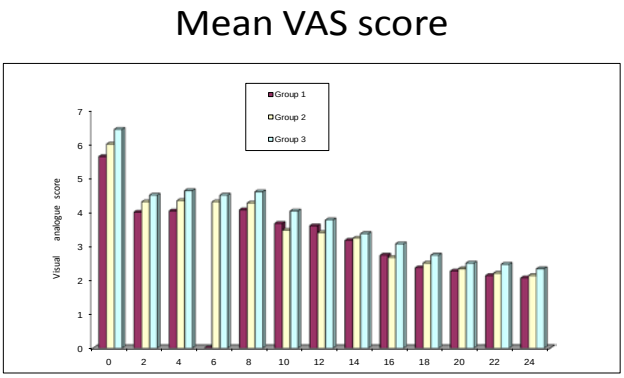

Figure 2: VAS score

When the VAS scores of the patients in Group III were compared with Groups I they were found to be significantly higher for 1st 6hr postoperatively. ($p<0.01$). When the sedation scores of the groups were compared, there was no statistical difference between groups. The tramadol consumption of the cases is shown in Table 2. The tramadol consumption in Group III was found to be significantly higher ($p<0.01$) than that in Groups I and group II. When the total tramadol consumption amounts for 24 h were compared, those of the control group were significantly higher than of groups that received medication ($p<0.01$). In addition, when medication groups were compared, the total tramadol consumption of Group II was found to be significantly higher ($p<0.01$). when no. of patient requiring rescue analgesia were compared, those with control group were higher as shown in table 4. The incidence of side effects such as postoperative nausea, vomiting, pruritus is shown in Table 3 according to patient groups. When the treatment-dependent side effect incidences were compared, nausea, vomiting, and itching were found to be higher in the control group . No respiratory depression requiring naloxone usage occurred in any patient.

Table 3 Side effect

	Group1	Group 2	Group 3
Side effect like nausea vomiting, pruritus,	3	3	5

Table 4 rescue analgesia required

	Group1	Group 2	Group 3
Patient require rescue analgesia	4	8	8

Discussion

In the present study, we used iv paracetamol 1 g. We assessed its effects on, postoperative analgesia effectiveness, Tramadol consumption, frequency of side effects, and determined that administration of paracetamol 1 g 30 min before induction resulted in decreased postoperative VAS values and total Tramadol consumption over 24 h. Furthermore, we observed fewer side effects and The negative effects caused by postoperative pain can be diminished with good postoperative analgesia. The requirement of treatment of postoperative pain is accepted by all authorities. Insufficient postoperative pain control leads to complications in both the short- and long-term periods. Among these complications, atelectasis, pneumonia, deep vein thrombosis, pulmonary embolism, psychological trauma, elongated intestinal distension, urine retardation, myocardial ischemia, and infarction may be considered.[5]Due to the negative effects and complications it causes in the patient, postoperative pain has to be treated in a fast and effective manner. Pain management should be started prior to pain initiation. With a good analgesic treatment plan for the patient in place, the anxiety, morbidity, cost, and length of hospital stay in the postoperative period are decreased

In one study,the authors preoperatively dispensed either oral oxycodone in one group (n=10) or 1,000 mg oral

paracetamol in another group (n=10) of female cholecystectomy patients and evaluated postoperative pain and side effects in each group; they found similar postoperative pain scores and side effects, with no difference determined between the groups.[6] In another studyon 60 patients who had a pan-retinal photocoagulation operation, they administered 1,000 mg oral paracetamol as a preemptive analgesic and compared the results with a placebo group. Subsequently, they found that postoperative pain scores subsided in the preemptive group in 24 hr.[7]

In the study by Heinof 60 patients who had undergone a minor gynecological operation, they dispensed 8 mg oral lornoxicam to one group 60 min before the induction and 1,000 mg oral paracetamol to another group and compared both groups to a control group. It was found that the VAS pain scores atpostoperative 30 and 60 min were lower in the groups in which medicine was administered than in the control group, with similar scores observed in the lornoxicam and paracetamol groups.[8]In our study, similarly, VAS scores were lower in the paracetamol group in the postoperative period.

Varrasi and colleaguesassessed the relative morphine consumption in a combined analgesic regimen after gynecologic surgery with iv doses of propacetamol 2 g or ketorolac 30 mg. Patients were assessed regarding total dose of morphine, pain intensity and global efficacy. They established that total morphine requirements were not significantly different between the propacetamol (10.6±4.8 mg) and ketorolac (10.2±4.4 mg) groups. The evolution of pain intensity also showed similar patterns in the two groups. The VAS scores at rest and in motion were determined.[9] In our study, the VAS pain scores were found to be lower in Groups I and II at the postoperative 1st 6 hr, but in Group III it was observed that those scores were higher. These results indicate that sufficient analgesic effectiveness was ensured after the postoperative 6 hr in Groups I and II. We believe that the high VAS pain scores of Group III points out the difficulty of applying effective analgesia with postoperative iv Tramadol after laparotomies. Additionally, the low values of the pain scores in the groups under medication may be explained by decreases in excitability in the central nervous system through blockade of nociceptive stimuli before damaging tissue architecture.In our study, the total Tramadol consumptions at 24 h in the preemptive Group I and intraoperative Group II were lower than in Group III. The total Tramadol consumptions of the patients in Group II were found to be significantly higher than in Group I. Reubenin their study comprising 60 patients who underwent arthroscopic knee surgery under spinal anesthesia, employed 50 mg rofecoxib as a preoperative analgesic and administered it before incision and at the end of the operation. They found that when compared with the placebo group, the first analgesia demand time was longer and total 24 h morphine consumption and pain scores were lower in the preemptive group relative to the other two groups.[10] In another study of 73 patients undergoing breast biopsy, it was determined that parenteral administration of 20 mg tenoxicam both preemptively and postoperatively increased the first analgesia demand time and lowered the VAS scores in the preemptive group. Consequently, it was deduced that tenoxicam has preemptive analgesic effectiveness in breast surgery.[11] Dahl and colleagues[27]evaluated the postoperative opioid-sparing effect of a pre-operative oral ibuprofen 800 mg and paracetamol 1000 mg in elective open hysterectomy patients that received test drugs orally 1 h before the start of anesthesia. They found differences between the groups in postoperative pain measured by any variable or opioid consumption at any time and stated that orally given ibuprofen or paracetamol does not have a

postoperative analgesic or opioid-sparing effect. This may have been due to first-pass elimination of orally medicated drugs.

In our study, total tramadol consumption for 24 h in the preemptive Groups I and II was lower as compared to Group III. Total tramadol consumptions of the patients in Group II were significantly higher as compared to Group I. The greater analgesic requirement observed in Group II as compared to Group I can be explained by the gradual reduction in effect of the paracetamol administered. We believe that since the preemptively delivered paracetamol prevents central sensitization, its analgesic effect continues longer than its effect period. As in many studies carried out with iv paracetamol usage, our study did not encounter any negative effects in hemodynamic parameters, such as intraoperative and postoperative SpO2, HR, and MAP., complications such as respiration depression, sedation, nausea, vomiting, urine retention, and itch may develop.[12,13,14,15] Sedation is the earliest indicator of respiratory depression. The MRSS for sedation is generally used to assess this. In the present study, we did not find an increase in sedation scale values to result in the occurrence of respiratory depression. Notwithstanding, the incidences of nausea, vomiting and itching were more frequent in Group III due to more tramadol consumption.The success of postoperative pain management has an influence on patient satisfaction. There are many factors that define this success. Patient anxiety, communication with service nurses, and preoperative enlightenment are a few of these factors. In our study, we asked the patients if they were satisfied with the present postoperative pain management at 24 h and whether or not they would desire the same pain management to be applied in the future. We determined from the responses given that the gratification rate was high in all groups. The majority of the patients emphasized that would like the same pain management to be applied in the future as well.. This finding suggests that patients who received paracetamol were more satisfied than those with iv tramadol alone.In conclusion, our findings indicate that preemptively administered iv paracetamol 1 g in patients undergoing a total abdominal hysterectomy operation has no negative effects on intraoperative or postoperative hemodynamic parameters, ensures an effective analgesia during the postoperative period, increases patient satisfaction by reducing postoperative morphine consumption and side effects, and thereby shortens the length of hospital stay. Therefore, we believe preemptively administered iv paracetamol 1 g can be confidently given for postoperative analgesia after elective abdominal surgery.

Conclusion

The present study to see preemptive analgesic effect of IV paracetamol in elective abdominal surgerieswas undertaken in indoor parturients admitted in NSCB Medical College,Hospital,Jabalpur (MP). After institutional and ethics committee approval and informed consent 90 patient of either sex of ASA physical status I and II aged between 20-60 years undergoing elective abdominal surgery were enrolled for the study and were randomly assigned to 3 groups of 30 each.

Group (I): IV paracetamol infusion 1gm given for 15-20 minutes, 30 minutes prior to induction.

Group (II): IV paracetamol infusion 1 gm given for 15-20 minutes prior to skin closure.

Group (III) : serve as a control group and receive normal saline as placebo.

From the present study it is concluded that:

preemptively administered IV paracetamol 1gm in patients undergoing elective lower abdominal surgery

- has no adverse effect
- Ensure effective analgesia post operatively

- Decrease tramadol consumption and side effects
- Decrease need for rescue analgesia

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