

Comparison of Paracetamol infusion with Diclofenac infusion for perioperative analgesia.

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ABSTRACT

Effective analgesia peri operatively is very much essential for managing any type of surgical cases. Opioid was commonly employed for managing these cases. Due to its known side effects, an alternative drug was selected and studied. Hence, we compare the quality and side effects of NSAIDs- paracetamol versus diclofenac infusion for peri operative analgesia. Sixty ASA I & II patients undergoing lower abdominal surgery was randomly selected and divided into two groups. Both groups were assessed and general anaesthesia was given. At the time of rectus abdominis muscle closure, Group P received paracetamol infusion and Group D received diclofenac infusion. Post operatively all patients were monitored, pain was assessed with VAS score and side effects were also noted. VAS score > 7 received rescue analgesics and results were tabulated. Most of the patients in paracetamol group had VAS score <7 for more than 5 hours after the surgery. The time to first request for rescue analgesia after injection of study drug was approximately 3 times as long with paracetamol compared to diclofenac, with no serious complications noticed. This indicates that i.v paracetamol infusion has better analgesia than i.v diclofenac infusion for acute post operative pain.

INTRODUCTION

Effective pain management is an important component of intra and post surgical care. Many patients, however continue to experience inadequate pain relief^[1]. Effective analgesia is important for early ambulation and postoperative hospital stay, thereby reducing the burden on patient's health and pocket. Opioids remains the preferred choice for severe pain; however, the adverse effect of these class of drug such as nausea, vomiting, sedation and respiratory depression may demerits the use of opioid under all circumstances^[2,3]. Non opioid analgesics (paracetamol, NSAIDs) are commonly used alone or in combination with Opioids for relieving post operative pain^[3]. In our institution Diclofenac infusion is commonly employed for managing post operative pain, due to its short duration and repeated administration an alternative drug was selected and studied. Paracetamol was one of it. Paracetamol (N-acetyl-para-aminophenol) is discovered in 1889 and is an active metabolite of phenacetin ^[4,5]. It is widely used analgesic, antipyretic and however, it has minimal anti inflammatory activity compared with aspirin ^[4,6].

A small amount is metabolized by mixed function oxidase enzyme to form highly reactive which is immediately conjugated with glutathione and subsequently excreted as cystein and mercaptine conjugate in overdose. Large amount of paracetamol are metabolized by

oxidation because of saturation of sulphate conjugation pathway, but once the protective intracellular glutathione stores are depleted hepatic and renal damage may ensue.

Aim of the study

To compare the peri operative analgesic efficacy of Paracetamol with Diclofenac infusion in patients undergoing lower abdominal surgeries with regards to 1) Duration of analgesia 2) side effects.

Inclusion criteria:

All patients aged between

- a) 18–60 years,
- b) ASA Grade I & II
- c) Patients posted for Lower Abdominal Surgeries.

Exclusion criteria:

- a) Patients with hepatic or renal disorder,
- b) ASA Grade III & above patients,
- c) Patients coming for emergency surgeries,
- d) Patients with any co-morbid diseases like IHD, Hypertension, Bronchial asthma, DM & Morbidly obese patients

MATERIALS AND METHODS

Over a period of 5 months duration, a prospective randomized double blinded study was performed in our institute. We studied 60 ASA I and II patients undergoing elective lower abdominal surgeries. The study was approved by hospital ethical committee. Written informed consent from patient was taken. Pre anaesthetic evaluation was performed, patient was premedicated and kept nil orally overnight.

Patient was shifted to operating room, IV line secured, essential monitors connected. Patient was denitrified and premedicated. Induction done with Inj Propofol 2.5 mg/kg and intubation achieved with NDMR (vecuronium), airway secured with appropriate size endotracheal tube. Anaesthesia was maintained with oxygen, nitrous oxide, volatile agent and vecuronium. Volatile agent used was halothane/Isflurane depending on the need.

Vitals monitored every 5 mins. At the time of rectus abdominis muscle closure the study medication was administered. Group P: 30 patients received 1g Paracetamol infusion and Group D: 30 patients received Diclofenac infusion. Patient extubated and shifted to recovery room.

Patients were visited at 0, 1, 5, 30 mins and 1, 2, 4, 8, 12 & 24 hrs after surgery and recorded the pain score on visual analogue scale (VAS: 0–10, 0= no pain and 10=worst pain). Side effects including nausea, retching, vomiting, respiratory depression, vertigo, somnolence, headache, if any were recorded.

If patient VAS score is greater than 7 (intolerable), then rescue analgesia was given.

At the end of the study, the data was compiled systematically and was subjected to statistical analysis using student 't' test and SPSS version 10.0 for windows. Value of $p < 0.05$ was considered significant.

RESULTS

The groups were comparable with respect to age, sex, weight and ASA physical status (Table 1). There was no statistically significant difference in the type and duration of surgery (Table 2). In Diclofenac group pain intensity increases with hours and made peak level in 2nd hour after operation as seen in figure 2. So patient had VAS score >7 and rescue analgesic was given. In paracetamol group also pain intensity increased with hours but peak level made at 6 hours after operation (Figure 1). Most of the patients in paracetamol group had VAS score <7 for more than 5 hours after the surgery. The time to first request for rescue analgesia after injection of study

drug was approximately 3 times as long with paracetamol compared to Diclofenac (Figure 3). There were no serious complications like respiratory depression, pruritus, itching, sedation observed in either group.

Table 1 : Demography

	Group D	Group P	<i>p</i> value
Mean Age	38.2	37.6	>0.05
Mean Weight	54.2Kg	52.3Kg	>0.05
Male: Female Ratio	12:18	14:16	>0.05

Table 2 : Surgical Procedures Performed

	Group D	Group P	<i>p</i> value
Surgical Procedures (Inguinal Hernia, Appendicectomy Etc.)	16	18	>0.05
Gynecological Procedures (Abdominal Hysterectomy)	14	12	0.1

Figure 1 : Number Of Patients Having VAS Score > 7 At That Time

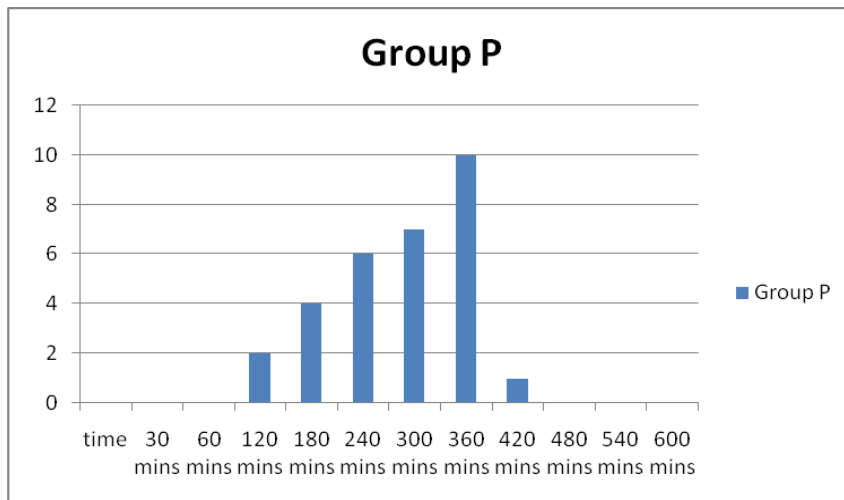


Figure 2 : Number of Patients Having VAS Score > 7 At That Time

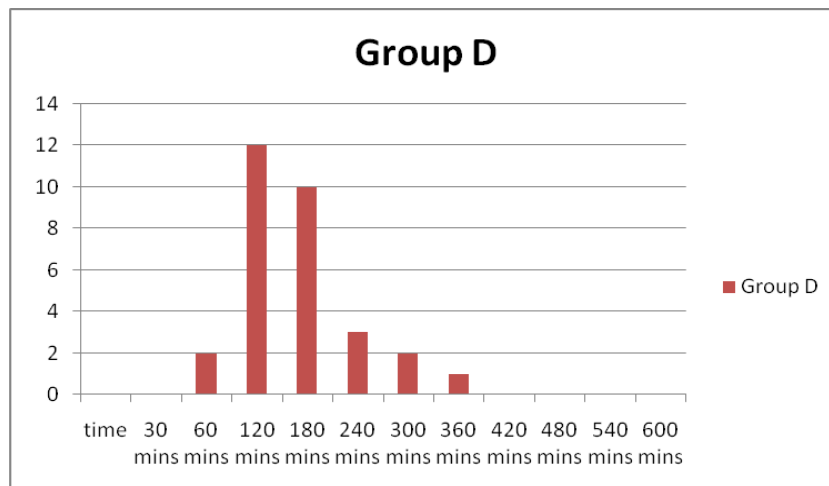
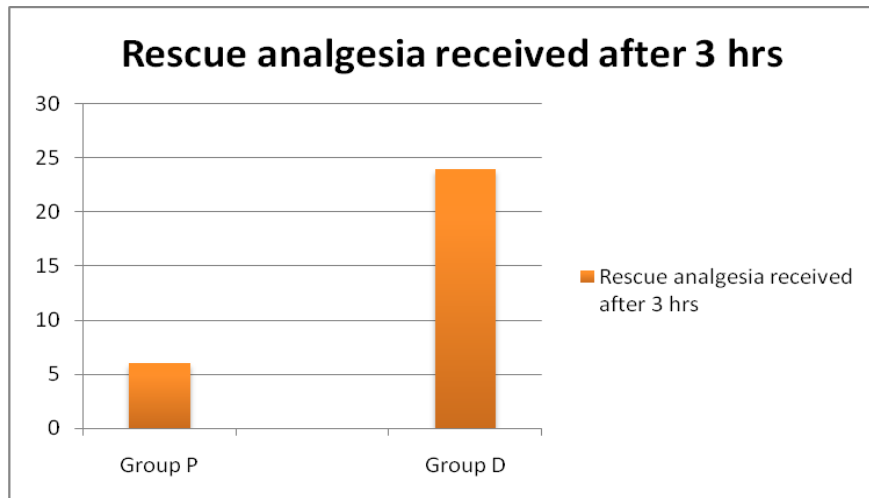


Figure 3: Rescue Analgesia Received After 3 Hours Surgery



DISCUSSION

The objective of our study was the comparison of Paracetamol infusion with Diclofenac infusion form for peri-operative analgesia for lower abdominal study. In the literature there was no data about the comparison of paracetamol with diclofenac infusion for the lower abdominal surgeries.

Management strategies for post-operative pain are aimed at reducing a patient's pain to a tolerable level. This is achieved mainly by using Opioids and non opioid drug. Non-steroidal inflammatory drugs (NSAIDs) such as acetaminophen, ibuprofen, ketorolac, diclofenac are popular drugs used for this purpose^[7].

Diclofenac inhibits both COX -1 and COX-2 forms of the cyclo-oxygenase enzyme, which is released peripherally following surgical trauma, sepsis and hypoxia ^[7]. Diclofenac can be given by rectal, intramuscular ^[7] study had also been conducted for cesarean deliveries ^[8] and recently by infusion mode.

Smith CHW, Hill L, Dyer RA^[8] did a comparative study on cesarean section with iv tramadol and diclofenac. And observed that, group receiving tramadol had a good and prolong pain relief post operatively.

The analgesic effect of Paracetamol is probably dependent on rate and amount of active drug reaching CNS where analgesic effect takes place. It is believed that selective inhibition of enzyme COX-3 in the brain and spinal cord explain the effectiveness of paracetamol in relieving pain and reducing fever without having unwanted systemic side effects ^[9].

Toxicity from paracetamol is not from the drug itself but from one of its metabolite N-acetyl-p- benzoquinonennimine (NAPQ1). Biotransformation of paracetamol involve conjugation with glucoronide and sulphate ^[10].

Intravenous administration of paracetamol has already demonstrated its analgesic efficiency in patients with postoperative pain following gynecologic surgery ^[11], hand surgery, spinal fusion surgery and orthopedic surgery ^[12-14].

Rawal, Allvin R, Amilon A ^[12] compared oral metamizol, oral tramadol and iv paracetamol for the post operative analgesia at home after ambulatory hand surgery. This study showed that tramadol was more effective than other drugs, but the side effects were higher in tramadol group.

Landwehr, Kiencke P, Giesecke T ^[15] compared iv paracetamol and metamizol for post operative analgesia after retinal surgeries. And they found that the analgesic effect were similar.

CONCLUSION

From the above study it can be concluded that paracetamol infusion provides a better and prolonged analgesia to the surgical patients post operatively as compared to diclofenac infusion.

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