International Journal of Medical and Health Research
ISSN: 2454-9142
Impact Factor: RJIF 5.54
www.medicalsciencejournal.com
Volume 4; Issue 7; July 2018; Page No. 174-176

Comparative evaluation of Diclofenac with Paracetamol for post-operative analgesia following laparoscopic cholecystectomy

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Abstract

The use of IV Paracetamol or IV Diclofenac as analgesia, using an opioid as rescue analgesic only when needed, would reduce the amount of opioid used and ensure a comfortable postoperative recovery period. Hence the proposed study was thus piloted to compare the effects of Paracetamol and Diclofenac as peri operative analgesic in laparoscopic cholecystectomy.

The patients were divided in two study groups as Group A & Group B. In Group A were administered IV Paracetamol 1 mg/kg (maximum 1g in 100ml infusion) over 15-20 minutes, 30 min prior to the end of surgery was administered. In group B IV Diclofenac sodium 2mg/kg maximum 75 mg in 100 ml of normal saline 30 minutes prior to the end of surgery was administered.

The data generated from the above study it can be concluded that Paracetamol infusion provides better and prolonged analgesia with low pain scores and lesser requirement for rescue analgesia compared to Diclofenac.

Keywords: laparoscopic cholecystectomy, intravenous paracetamol, diclofenac sodium

Introduction

Cholecystectomy is the surgical removal of the gallbladder. It is a common treatment of symptomatic gallstones and other gallbladder conditions. Surgical options include the standard procedure, called laparoscopic cholecystectomy, and an older, more invasive procedure, called open cholecystectomy. The surgery can lead to post cholecystectomy syndrome, as well as more serious complications such as bile duct injury. Laparoscopic cholecystectomy has now replaced open cholecystectomy as the first-choice of treatment for gallstones and inflammation of the gallbladder unless there are contraindications to the laparoscopic approach. This is because open surgery leaves the patient more prone to infection. Sometimes, a laparoscopic cholecystectomy will be converted to an open cholecystectomy for technical reasons or safety [1].

Laparoscopic cholecystectomy requires several (usually 4) small incisions in the abdomen to allow the insertion of operating ports, small cylindrical tubes approximately 5 to 10 mm in diameter, through which surgical instruments and a video camera are placed into the abdominal cavity. The camera illuminates the surgical field and sends a magnified image from inside the body to a video monitor, giving the surgeon a close-up view of the organs and tissues. The surgeon watches the monitor and performs the operation by manipulating the surgical instruments through the operating ports.

Laparoscopic bile duct exploration (LBDE) is recommended in current treatment guidelines for the management of choledocholithiasis with gallbladder in situ. Failure of this technique is common as a consequence of large or impacted common bile duct (CBD) stones. A new technique, LABEL (Laser-Assisted Bile duct Exploration by Laparoendoscopy) has been developed to enhance LBDE in cases of impacted or large stones using holmium-laser increasing the feasibility of the transcystic stone retrieval and reducing overall operative time in the treatment of choledocholithiasis [3].

Adequate analgesia is of utmost importance for early ambulation and discharge reducing hospital stay. The use of opioids for pain control during and after surgery is a common procedure in anaesthesia and a preferred choice for severe pain. Some of these are NSAIDS including diclofenac and Paracetamol. Primary mechanism of these drugs is to inhibit the cyclooxygenase and prostaglandin synthesis which is considered to be important factor in the prevention of hypersensitivity and pain.

The use of IV Paracetamol or IV diclofenac as analgesia, using an opioid as rescue analgesic only when needed, would reduce the amount of opioid used and ensure a comfortable postoperative recovery period. Paracetamol and diclofenac are the two non opioid drugs that are being used in perioperative period. Paracetamol is one of the most ubiquitous drugs in hospitals and community settings. With the recent availability of an intravenous solution, its use is revitalised especially in the perioperative setting. Diclofenac is non-steroidal anti-inflammatory drug taken or applied to reduce inflammation and as an analgesic to reduce pain in certain conditions [4].

Hence the proposed study was thus piloted to compare the effects of paracetamol and diclofenac as peri operative analgesia in laparoscopic cholecystectomy. The main aim of the present study was to evaluate the postoperative visual analogue pain score (VAS) and requirement of additional analgesic, despite administration of paracetamol or diclofenac in post operative period.

Methodology

The study was planned in the Anugrah Narayan Magadh Medical College and Hospital, age group of the patients is ranges from 20 to 60 years. Total 60 patients were evaluated for the study. As per the classification of the American Society of Anaesthesiologists I and II physical conditions were enrolled on to the study. After taking informed written consent and approval of the Institutional Ethics Committee the study was in tiated.

The patients were divided in two study groups as Group A & Group B.

In Group A were administered IV paracetamol 1 mg/kg (maximum 1g in 100ml infusion) over 15-20 minutes, 30 minprior to the end of surgery was administered.

In group B IV diclofenac sodium 2mg/kg maximum 75 mg in 100 ml of normal saline 30 minutes prior to the end of surgery was administered.

Following was the inclusion and Exclusion criteria of the study:

Inclusion criteria

Patients having Age 20- 60 years. Patients as per American Society of Anaesthesiologists I and II physical conditions patients.

Exclusion criteria

Patients with history of drug allergy, bleeding disorders [4, 5], asthma, gastro intestinal system bleeding, renal insufficiency, etc.

Results & Discussion

The data from the total 60 study patients enrolled in two study groups were collected and presented as below. The Group A patients were administered IV paracetamol 1 mg/kg (maximum 1g in 100ml infusion) over 15-20 minutes, 30 min prior to the end of surgery was administered. In group B IV diclofenac sodium 2mg/kg maximum 75 mg in 100 ml of normal saline 30 minutes prior to the end of surgery was administered.

Table 1: Demographic Data

Parameter	Group A	Group B
Age	32-55 years	35-60 years
Weight	49 – 68 kg	56-72 kg
ASA I	19	25
ASA II	11	5
Duration of Surgery	42-58 mins	40-59 mins
Duration of Analgesia	95-115 mins	100-120 mins
Total Cases	30	30

Table 2: Pain Score: VAS

Parameter	Group A: Paracetamol Administered	Group B: Diclofenac Administered
30 mins	0.6 – 2.6	0.8 - 1.6
60 mins	1.0 –2.4	1.1 – 2.9
120 mins	1.1 – 2.5	2.4 – 3.9
240 mins	1.1 – 2.8	0.8 – 4.7
600 mins	1.6 – 4.2	0.95 –3.0

One of the major benefits of laparoscopic technique compared with standard open surgery is the reduction of postoperative pain. Nevertheless, it is recognised that the skin and facial incisions through which laparoscopic trocars are inserted can still lead to significant degree of pain in post-operative period [5]. Pain is a subjective sensation varying from person to person depending upon the psychometric personality, age, nature of operation. Relief of pain is of paramount importance to the patients as it causes discomfort and also increases risk of pulmonary complications. The relief of postoperative pain helps in effective coughing and adequate ventilation. Number of pharmacological and non-pharmacological approaches, are being used for the relief of post-operative pain and investigations are still underway to find best method or pharmacological agent for postoperative analgesia.

Yoganarsimha *et al*. in their comparative studies also concluded that paracetamol infusion provides a better and prolonged analgesia to the surgical patients postoperatively as compared to diclofenac infusion [6]. It is believed that since intra operative delivery of paracetamol prevents central sensitization, its analgesic effect continues longer than its effect period [7]. Chandrasekhar an *et al*. suggested that analgesic effect of paracetamol is probably dependent on rate and amount of active drug reaching CNS where analgesic effect takes place. The authors further stated that selective inhibition of enzyme COX 3 in the brain and spinal cord explains the effectiveness of paracetamol in relieving pain and reducing fever without having unwanted systemic side effects [6].

Conclusion

The data generated from the above study it can be concluded that paracetamol infusion provides better and prolonged analgesia with low pain scores and lesser requirement for rescue analgesia compared to diclofenac.

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