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Original Research Article

Preemptive Analgesic Effects and Effects on Hemodynamic Parameters of Intravenous Paracetamol in Abdominal Surgeries-A Multicentre Comparative Study

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ABSTRACT:
Background & Method: The present study entitled "preemptive analgesic effects of intravenous paracetamol in abdominal surgeries" was undertaken in the department of anesthesiology in the four different associated hospitals across India in the similar study duration with equal number of sample size from each hospital. The study involves observations on 80 patients (20 from each hospital , 10 in the cases group and 10 in the control group) of ASA grade I and II between age group 20-60 years, scheduled to undergo abdominal surgery under general anesthesia.

Result: Pre-induction period the mean pulse was comparable in either groups. Post-induction, 3 minutes after of induction of anesthesia, mean pulse in paracetamol group was lower compared to control and the value was statistically significant $P<0.05$.Mean Arterial Pressure (MAP) at different time intervals during the procedure.The MAP was lower post intubation up-to 10 minutes as seen by mean values which were statistically significant ($P<0.05$). MAP at 5 min and 10 min post intubation were 0.011 and 0.049 respectively.After 10 minutes not much statistically significant difference was seen ($P>0.05$) and MAP was comparable.

Conclusion: The findings of present clinical retrospective observational study allow us to conclude that one gram paracetamol when given pre-emptively provided hemodynamic stability and had better pain scores.

Keywords: Preemptive, Analgesic, hemodynamic, Intravenous,Paracetamol&Abdominal.

Study Designed: Comparative Study.

1. INTRODUCTION

Pain is an unpleasant sensory and emotional experience related to actual or potential tissue injury. Any surgical procedure may result in post-operative pain which can trigger

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biochemical and physiological stress response.
Post-operative pain is mainly nociceptive in nature. Any invasive procedure induces central and peripheral sensitization along with hyperalgesia which if not treated leads to chronic post-operative pain. Post-operative pain may impact patients operative outcomes as it may lead to development of tachycardia, hyperventilation, decrease in alveolar ventilation, insomnia and poor wound healing. Also it may progress to chronic pain which may in turn affect patients well-being and satisfaction.
Pre-emptive analgesia is an anti nociceptive treatment that prevents establishment of altered processing of afferent input which amplifies post- operative pain.
In our study, we used paracetamol as the anti nociceptive agent to find its analgesic effect in intra abdominal surgeries.

Aims and Objectives
The present study entitled "preemptive analgesic effects of intravenous paracetamol in abdominal surgeries" was undertaken in the department of anesthesiology in the four different associated hospitals across India in the similar study duration with equal number of sample size from each hospital.
Primary objective:
To observe effect of preemptive IV paracetamol on post-operative analgesia in abdominal surgeries.
Secondary objective:
To evaluate the effects of paracetamol on the heart rate and mean arterial pressure.

2. MATERIALS AND METHODS

The present study entitled "Preemptive Analgesic Effects of Intravenous Paracetamol in Abdominal Surgeries" was carried out at department of anesthesiology, in the four different hospitals, namely Durgapur Steel Plant Hospital ,West Bengal, Rukmani Birla Hospital , Jaipur, Sri Padmavathi Multi Specialty Hopsital, Tirupati Andhra Pradesh and Peoples College of Medical Sciences and Research Center, Bhopal
The study involves observations on 80 patients (20 from each hospital , 10 in the cases group and 10 in the control group) of ASA grade I and II between age group 20-60 years, scheduled to undergo abdominal surgery under general anesthesia.

Patients confirming to the following criteria were included:
1. Patients belonging to classification ASA I and II (American society of Anesthesiologists)
2. Age group 20 – 60 years of both sex
3. Patients scheduled for elective surgeries under general anesthesia.

Following patients were excluded from the study
1. Patient refusal for the procedure.
2. Patients with known hypersensitivity to study drugs.
3. Operative time less than 1 hour or more than more than 3hours
4. Patient with known coagulopathy or patient on anticoagulants.
5. Patientswithseveresystemicdisorder(respiratory,cardiac,hepatic,renal diseases)
6. Patientswithneurological,psychiatricdisorders.
7. Pregnantandlactatingpatients.
8. PatientsbelongingASAIIIANDIVcategory

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StudyDuration: 2 months. From July 2020 to August 2020

3. METHODOLOGY

All patients were evaluated thoroughly and a day before surgery. A thorough systemic and general examination along with routine investigations was done during pre-anesthetic evaluation. All patients were allowed and explained the informed consent in the language they can understand, read and write. During the preoperative visit patients were explained to quantify their pain on visual analog scale.Airway assessment was carried out to anticipate and prepare for any difficult intubation.A written consent was obtained after counseling and explaining the procedure.Patients had been instructed not to take anything orally 6-8 hours before surgery.Anesthesia machine with gas inlets connected to pipeline supply and backup cylinders, necessary resuscitation equipment's and drugs needed for administration of general anesthesia was confirmed and checked.Intravenous access was established with 18 G cannula.Patients were shifted to OT after confirming the Nil By Mouth(NBM) status.Multi parameter monitor was applied to monitor ECG, oxygen saturation, Blood pressure (SBP, DBP and MAP) and respiratory rate. Continuous monitoring at pre decided intervals was done in all the patients and recorded.

Procedure of Administering Paracetamol/Normal Saline
Patient was taken into OT after confirming the NBM status. Multiparameter monitor was connected and baseline vital parameters (pulse , Non-invasive blood pressure, oxygen saturation and respiratory rate) were noted and recorded. 100ml infusion of Inj. Paracetamol 1gm in cases Or Normal saline 100ml in control was started 15 minutes before induction. Vital parameters were again recorded and patient was administered general anesthesia as follows -

Patient was pre-medicated with ondansetron 4mg, glycopyrrolate 0.01mg/kg and fentanyl 1-2mcg/kg given intravenously. After pre-oxygenating the patient with 100% oxygen for 3 min anesthesia was induced with propofol 2mg/kg and succinylcholine 2mg/kg. After direct laryngoscopy, airway was secured with appropriate sized cuffed endotracheal tube. Cuff was inflated, bilateral air entry confirmed and tube was secured. General Anesthesia was maintained with oxygen, nitrous oxide and isoflurane. For muscle relaxation Atracurium 0.5mg/kg was given as loading dose and thereafter top-up was given as per requirement. At the end of surgery residual neuromuscular blockade was reversed with IV neostigmine 2.5mg and glycopyrrolate 0.4 mg. Oral suctioning and tracheal extubation was performed after onset of spontaneous breathing, spontaneous deglutition and adequate motor power assessment by asking the patient to lift head for 5-10 sec.
Although the patients monitoring was carried out continuously but data were recorded at the time of entry of patient in O.T., 15 minutes before induction(IV paracetamol/ Normal saline administered), at the time of induction of anesthesia and thereafter at interval of 1,3,5,10,20,30,60,90,120,150 and 180 minutes (as per procedure time) and after shifting patient in recovery room.Hemodynamic variables (Heart Rate -HR, Blood Pressure - BP, oxygen Saturation - SPO2, Electrocardiogram - ECG) were recorded periodically as mentioned earlier.

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Evaluation of Patient Intraoperatively and Postoperatively

After the administration of General anesthesia following parameters were recorded

1. Vital parameters. The amount of muscle relaxant used and concentration of inhalational agent was adjusted adequately to maintain adequate depth of anesthesia for surgery.
2. The duration of analgesia: the time interval from the injection of the drug till patient felt pain at the site of operation: recorded in hours and minutes.
3. Side effects and complications:

(a) Patients were declared to have bradycardia if heart rate was less than 60 beats per minute at any time of observation and patients were medicated with injection Atropine sulphate 0.3 to 0.6 mg in divided dose.

(b) patient was considered to have hypotension when blood pressure was less than 20 % of pre-induction value or Mean arterial Pressure(MAP) <65 . Patients showing hypotension were treated with injection ephedrine 6–12 mg intravenously and fluid bolus of 250 ml ringer lactate or normal saline.

Evaluation of Postoperative Pain Relief

The intensity of postoperative pain was evaluated using visual analog scale (VAS) with grade 0 (no pain) to 10 (worst pain). Pain score were noted every 5 to 10 min initially and then hourly till the patient reports VAS score of 5. Analgesia was considered satisfactory if the score was 3 or less. The time of first rescue analgesic required at visual analogue scale (VAS) ≥ 5.

Statistical Methods Sample Size

To calculate the sample size based on the mean difference with an approximate 95% confidence level,10 patients were observed in each group in a hospital. Total numbers of cases studied were 20 in each hospital, making a total sample size of 80.

Statistical Analysis

Collected data was analyzed by means of statistical software SPSS.

Independent t test was used for comparison between two groups for continuous variables like age, weight, heart rate, systolic blood pressure, diastolic blood pressure, mean arterial pressure, first dose of rescue analgesic.Chi square test was used for ASA and gender. Continuous variables were presented as mean ± SD.

Result were considered statistically significant if P value < 0.05.

Observations and Results

The present clinical observational study entitled “Pre-emptive analgesic effects of intravenous paracetamol in abdominal surgeries” has been undertaken in the Department of Anesthesiology on 80 patients of both sex having average weight, height and free from systemic diseases.

80 patients observed in the study were divided in two groups. Group I(cases) was given intravenous paracetamol one gram 15 minutes before induction of anesthesia and Group 2(control) was given Normal saline 15 minutes before induction as placebo. Patients underwent various surgeries under uniform method of General Anesthesia with gas, oxygen, relaxant and analgesic techniques on Bain circuit.

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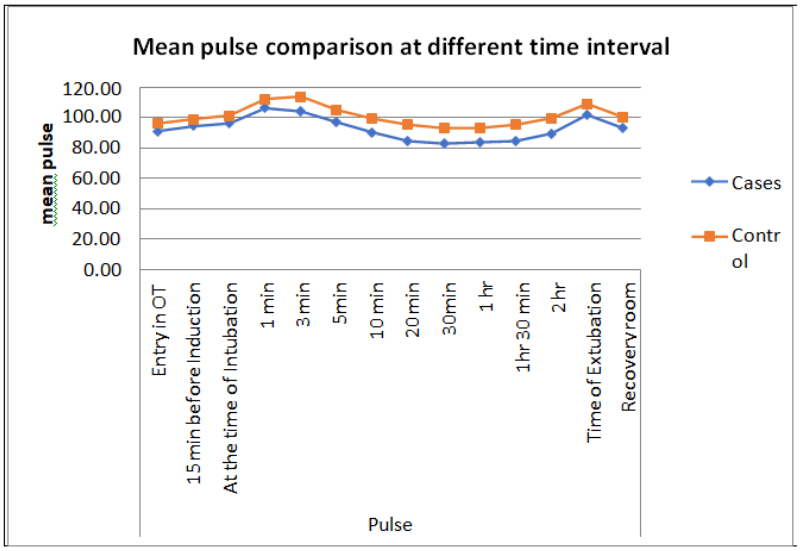
Patients were monitored peri-operatively via multi-parameter monitor to record vitals like-pulse rate, systolic and diastolic blood pressure via non-invasive method, electrocardiogram, oxygen saturation and respiratory rate. The observations were recorded at various intervals for entire period of surgery to ensure cardiovascular stability during procedure.
All the study parameters were compared in the form of charts and graphs.



The above chart shows that, in the pre-induction period the mean pulse was comparable in either groups. Post-induction, 3 minutes after of induction of anesthesia, mean pulse in paracetamol group was lower compared to control and the value was statistically significant P<0.05.

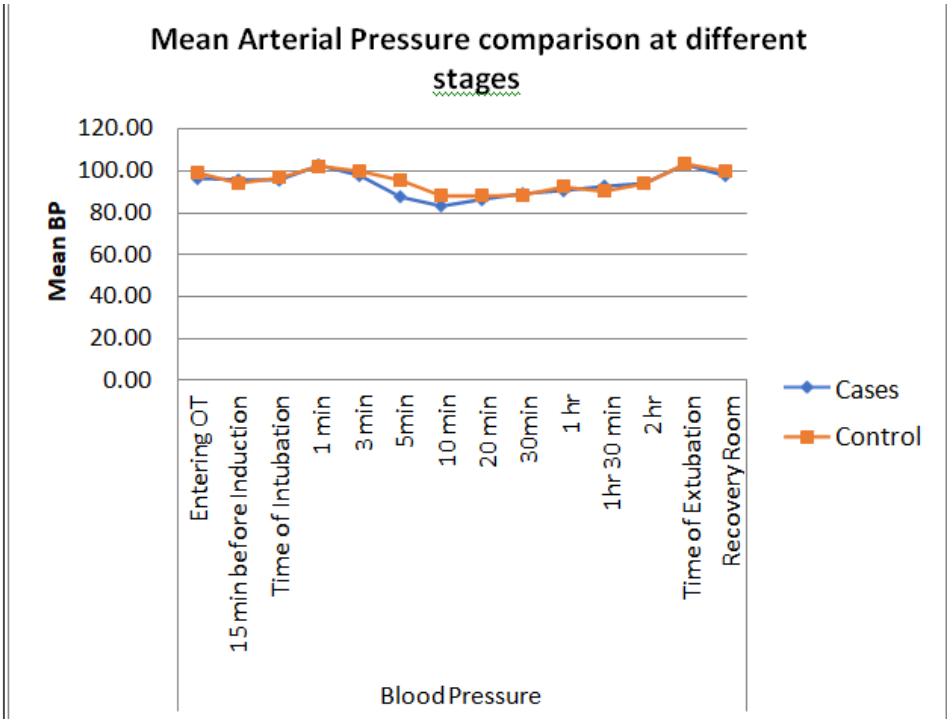


Figure shows that the mean arterial pressure (MAP) at different time intervals during the procedure.The MAP was lower post intubation up-to 10 minutes as seen by mean values

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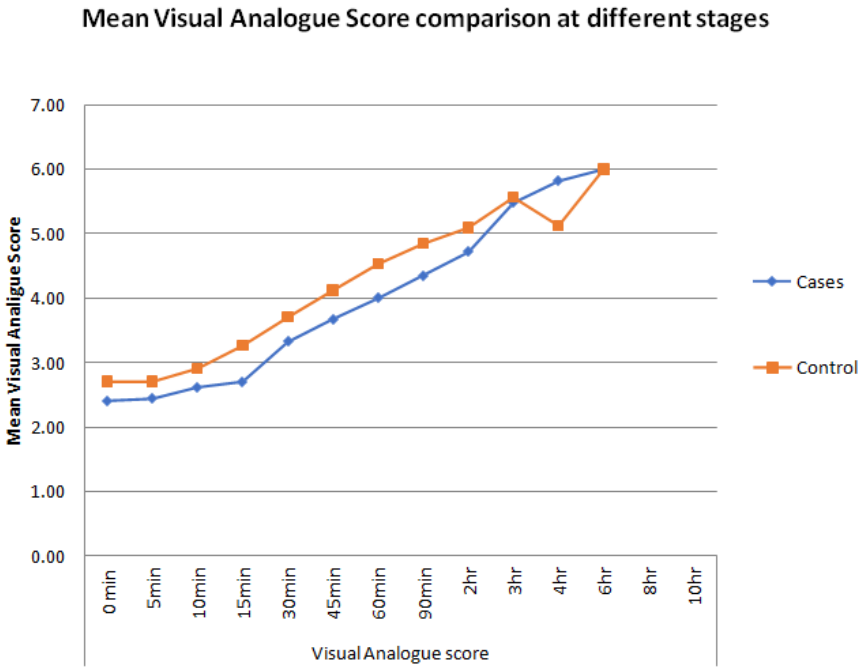
which were statistically significant (P<0.05). MAP at 5 min and 10 min post intubation were 0.011 and 0.049 respectively.After 10 minutes not much statistically significant difference was seen (P>0.05) and MAP was comparable.



FigureShows that mean pain scores in cases(paracetamol group) is relatively lower as compared to that in control group.

4. CONCLUSION

The findings of present clinical retrospective observational study allow us to conclude that one gram paracetamol when given pre-emptively provided hemodynamic stability and had better pain scores

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