

# To Compare the Mean Postoperative Pain Score between Intravenous Paracetamol Vs Intravenous Ketorolac among patients undergoing Gynecological Abdominal Surgery

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## ABSTRACT

**Background:** Post-operative pain is one of the common concerns in all the surgical interventions including gynecological surgeries. There is always a need for the agent with better efficacy and minimal side effect profiles.

**Aim:** To compare the mean postoperative pain score between intravenous Paracetamol vs intravenous ketorolac among patients undergoing gynecological abdominal surgery

**Study design:** Randomized Controlled Trial

**Setting & duration:** Department of Anesthesia, Hameed Latif Hospital, Lahore from 12-06-2018 to 12-12-2018

**Methodology:** In this study, females with age 20 - 50 years with ASA I and II undergoing gynecological abdominal surgery were included. Group A was administered with intravenous paracetamol and group B with ketorolac. Pain was measured in terms of mean of numerical rating scale recorded at 12 hours postoperatively.

**Results:** In the present study there were total 80 cases included, 40 in each group. The mean age in group B was 37.66±12.67 years and in group A was 41.29±11.36 years Mean post operative pain score was 3.05±0.61 vs 3.56±0.89 in group B and A with p= 0.04 Mean post operative pain was 3.04±0.61 vs 3.51±0.77 with p= 0.03 in cases with BMI > 25. There was no significant difference in terms of type of procedure and mean pain score in both groups.

**Conclusion:** Ketorolac is significantly better than Paracetamol in gynecological abdominal surgeries and this difference is also significantly better in cases with BMI > 25.

**Keywords:** Pain, ketorolac, paracetamol, BMI

## INTRODUCTION

Components such as the sensory-discriminative, affective (emotional), vegetative (autonomic), and motor aspects of pain can be broken down into four fundamental sub-components. Finding the source of an acute pain episode is not difficult. The body's response to pain is similar to that of the stress response in terms of physiological changes. Acute, high-intensity pain is extremely debilitating on the patient's mind<sup>1</sup>.

Acute pain is generally relieved with a combination of effective symptomatic analgesic medication and causal treatment. The likelihood of chronic pain development is considerably lowered if an effective analgesic therapy is started early in the acute phase of pain. When it comes to preventing post-herpetic neuralgia, analgesic treatment might be used as an example. Neuroendocrine, immune, and inflammatory responses can be triggered by acute pain (psycho-neuro-endocrino-immunological changes). As a result, stress hormone levels rise, tissue breakdown occurs, immune suppression occurs, myocardial oxygen consumption increases due to tachycardia and increased cardiac output, thromboembolism is more likely, vasoconstriction occurs, GI motility decreases, lung function declines, and as a result, morbidity and mortality rise. This is because of the increased risk of these adverse effects. Trauma, sickness, and surgery can all contribute to a person's anxiety levels rising to unhealthy levels<sup>2</sup>.

In order to diminish the stress response and, ultimately, morbidity and mortality, a synergic causative and symptomatic remedy is required. When patients are given enough analgesia early in their recovery, they are able to leave the hospital sooner and get outpatient treatment, which minimises the risk of postoperative complications. Most patients will experience some level of anxiety or panic at some point during their treatment. A

comprehensive preoperative interview and psychological preparation can lessen the severity of these alterations. Psychological alterations are strongly affected by the origin and duration of severe pain. The better a patient understands the underlying causes and mechanisms of their pain, the more effectively they can cope with it and its effects<sup>3</sup>.

The perception and response to acute pain is greatly influenced by our genetic composition, cultural and social background, age, and gender. Certain groups of patients are at a higher risk of inadequate pain management and require special attention, namely children, geriatric patients and patients with communication problems (critical state, cognitive disorders, language barriers).

The objective of the study was to compare the mean postoperative pain score between intravenous Paracetamol vs intravenous ketorolac among patients undergoing gynecological abdominal surgery.

## MATERIALS AND METHODS

This randomized Controlled Trial was conducted in the Department of Anesthesia, Hameed Latif Hospital, Lahore from 12-06-2018 to 12-12-2018. Sample size of 80 cases (40 in each group) is calculated with 95% confidence level, 80% power of test and taking expected mean±S.D of mean postoperative pain score in both groups i.e., 2.25±0.44 in intravenous paracetamol group and 1.88±0.34 in intravenous ketorolac group in patients undergoing gynecological abdominal surgery<sup>4</sup>. Non probability consecutive sampling technique was used.

**Inclusion criteria:** Females of age 20-50 years, undergoing gynecological abdominal surgery including hysterectomy, myomectomy, ovarian cystectomy and C section were enrolled

**Exclusion criteria:** Females with ASA III or IV, history of allergy to paracetamol, ketorolac or tramadol, bleeding diathesis, Obese (BMI>30) and taking antidepressants and anxiolytics were excluded from the study.

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**Data collection:** After approval from the hospital ethical committee, all patients who presented in the department of surgery through out-patient department, undergoing elective open abdominal surgery (hysterectomy/myomectomy/ ovarian cystectomy/ C section) and fulfilling the selection criteria, were included in the study. A valid informed consent was taken after counselling the patients regarding the procedure & objective of the study. The demographic information in female cases like age was recorded. All the information was collected through a specially designed proforma. Randomization of patients to study and control groups was performed using random access table. All the patients received a routine general anesthetic with standard monitoring. Patients were divided into two groups:

Group A: patients received IV paracetamol 1 g stat before 30 min completion of surgery

Group B: patients received IV ketorolac 30 mg stat before 30 min completion of surgery.

Pain were scored using visual analogue scale (VAS) on a pre-designed proforma at 12 hours of surgery. On numerical rating scale; 0 was no pain, 1-3 as mild pain, 4-7 as moderate pain, and 8-10 was severe pain. All the results were collected and recorded on same proforma.

**Data analysis:** All the collected data was entered into SPSS version 22 and analyzed. Independent sample t test was used to compare the mean pain score at 12 hours between two groups. p value  $\leq 0.05$  was considered as significant.

## RESULTS

In the present study, there were total 80 cases included, 40 in each group. The mean age in group B was  $37.66 \pm 12.67$  years and in group A was  $41.29 \pm 11.36$  years as shown in table 1. The most commonly performed procedure was C section seen in 22(55%) and 19(47.5%) cases in each group as in table 2. Mean post operative pain score was  $3.05 \pm 0.61$  vs  $3.56 \pm 0.89$  in group B and A with  $p = 0.04$  as shown in table 03. Mean post operative pain in group B and A was  $3.13 \pm 0.67$  vs  $3.47 \pm 0.84$  with  $p = 0.47$  in age group 20-34 years and  $3.09 \pm 0.57$  vs  $3.44 \pm 0.83$  with  $p = 0.31$  in age group 35 to 50 years as in table 04 respectively. Mean post operative pain was  $3.04 \pm 0.61$  vs  $3.51 \pm 0.77$  with  $p = 0.03$  in cases with BMI  $> 25$  as in table 05. There was no significant difference in terms of type of procedure and mean pain score in both groups as shown in table 06.

Table 1: Demographics of patients

	Group	
	IV Ketorolac	IV Paracetamol
n	40	40
Age	$37.66 \pm 12.67$	$41.29 \pm 11.36$
<b>Type of procedures performed</b>		
C section	22	19
Ovarian cystectomy	8	7
Hysterectomy	7	10
Myomectomy	3	4

Table 2: Comparison of post-operative pain in both groups

	Group A	Group B
n	40	40
Post-operative pain	$3.05 \pm 0.61$	$3.56 \pm 0.89$

P value 0.04

## DISCUSSION

Any surgical operation comes with a reasonable expectation of discomfort. Pre- and post-operative analgesia is critical to the success of any surgical treatment. Managing surgical pain leads to early discharge, a decreased hospital stay, lower expenditures, and improved patient satisfaction<sup>5</sup>. Preventing adverse effects while yet delivering enough analgesia is the primary objective of postoperative pain management. When oral or intravenous options aren't an option after surgery, the intravenous method is the best option<sup>6-9</sup>.

For this reason, opioids are commonly used to alleviate postoperative discomfort. However, its side effects, such as nausea, vomiting, itching, and respiratory depression, are a cause for worry. Compared to other opioids, tramadol has fewer negative effects and is less likely to lead to overuse or addiction, making it a popular choice for post-operative pain management<sup>10-13</sup>.

The amount of narcotic medication required when acetaminophen or non-steroidal anti-inflammatory medicines are used with opioids is reduced. In terms of safety and analgesic effects, paracetamol (acetaminophen) is a well-known drug.<sup>4</sup> Non-opioid analgesics like this one work by suppressing the production of prostaglandins in the central nervous system, which results in analgesia. Within 5 to 10 minutes after dosing, injectable paracetamol gives pain relief. It has no sedative effect and has no serious side effects including respiratory and circulatory depression. Non-steroidal anti-inflammatory medication (NSAID) ketorolac is. It has been found to have opioid sparing effects and is utilised for the short-term treatment of moderate to severe pain by lowering the synthesis of prostaglandins<sup>14,15</sup>.

In the present study, mean post operative pain score was  $3.05 \pm 0.61$  vs  $3.56 \pm 0.89$  in group B (ketorolac) vs group A (paracetamol) with  $p = 0.04$ . These results were comparable to the findings of the previous studies done in the past.

The effectiveness and safety characteristics of a variety of medications and combinations have been studied in several studies in the past. There was a wide range of results when analgesics were tested in varying conditions, and the results were not always consistent. There was a statistically significant difference in the mean Visual Analogue Score (VAS) ratings at 2 and 4 hours between paracetamol- and ketorolac-treated individuals. Another finding from this research was the superior analgesic effectiveness of ketorolac 30mg IV over paracetamol 1gm IV for postoperative pain reduction in patients who had abdominal hysterectomies performed under spinal anaesthesia without any severe side events of at least one<sup>10</sup>.

There was no significant difference between the two groups in another investigation. Furthermore, they said that there was no statistically significant difference in the mean VAS ratings at 2 and 4 hours between patients taking paracetamol and those taking ketorolac. It was shown that paracetamol 1g stat + 3g/24h infusion is equally efficacious as ketorolac 30mg stat + 90mg/24h infusion in the treatment of post-VATS pain<sup>11</sup>.

A research by Kumar et al., found that intravenous paracetamol and intravenous ketorolac reduced post-operative pain in patients having gynaecological abdominal surgery (hysterectomy) by  $2.25 \pm 0.44$  and  $1.88 \pm 0.34$ , respectively<sup>15</sup>. Further research by Kumar G et al. compared the effectiveness of ketorolac 30mg IV to that of diclofenac 75mg IV and paracetamol 1gm IV, and showed that patients who got ketorolac had a considerably lower VAS score than those who received diclofenac. None of the groups experienced major negative effects.

For post-operative analgesia following knee arthroscopy, Morrow et al. compared diclofenac with ketorolac and concluded that ketorolac was superior than diclofenac. In terms of effectiveness, this outcome is in line with what we found in our own research on ketorolac. A similar study by Forbes et al. found that the combination of ketorolac, ibuprofen and paracetamol, as well as the paracetamol-codeine combination, reduced postoperative pain in patients undergoing oral surgery. In terms of post-operative analgesia, they discovered that ketorolac and ibuprofen were both superior than paracetamol<sup>16,17</sup>.

Ketorolac and diclofenac were shown to be equally efficacious in the study by Fredman et al after laparoscopic cholecystectomy when they were compared. Because the injections were given intramuscularly in the previous trial rather than intravenously in this one, that study's findings were limited<sup>18</sup>.

In the present study, mean post operative pain was  $3.04 \pm 0.61$  vs  $3.51 \pm 0.77$  with  $p = 0.03$  in cases with BMI  $> 25$ . There were no such cut off values used in the studies done in the past and can be explained by the factor that the cases that had BMI

more than 25, they were obese and hence had more stretch and pain at the surgical site and that was not covered with paracetamol only and hence here ketorolac led to significant degree of relief.

There were few limitations of this study, as this study did not elaborate the degree of reliever analgesia needed and also the signs of other parameters were not looked in the form of increased heart rate etc. However, there were many strengthening points as well, as this study compared the two most commonly used drugs in post operative duration.

## CONCLUSION

Ketorolac is significantly better than Paracetamol in gynecological abdominal surgeries and this difference is also significantly better in cases with BMI > 25.

**Conflict of interest:** Nothing to be declared

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