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# Efficacy of Gabapentin as Pre-emptive Analgesia in Hysterectomy: Case-Control Study

**[1]Dr. Niharika M, [2]Dr Lella Nageswara Rao**

[1]Postgraduate, Department of Anaesthesia, Katuri Medical College, Dr. YSR University of Health Sciences, Andhra Pradesh, India

[2]Professor and Head, Department of Anaesthesia, Katuri Medical College, Dr. YSR University of Health Sciences, Andhra Pradesh, India

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**Corresponding Author:** Dr. Niharika M, Postgraduate, Department of Anaesthesia, Katuri Medical College, Dr. YSR University of Health Sciences, Andhra Pradesh, India

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## ABSTRACT

### Background

Management of pain is a vital component in the postoperative care of patients after surgery. There are various therapeutic options to tacklepost-operative pain. Gabapentin has now become an integral part of multimodal analgesia along with opioids. In spite of various previous studies and different analgesic techniques available, pain relief was still found to be inadequate in many patients in our tertiary care center. Hence the current study was taken up.

### Aim

To assess the effect of oral gabapentin on postoperative pain among patients undergoing total abdominal hysterectomy under epidural anaesthesia.

### Methods

This randomized, case-control study was conducted at a tertiary care centre among 100patients scheduled for total abdominal hysterectomy. The study was done from January 2022 to December2022. Patients were randomized into groups of control or placebo (P) and gabapentin (G) or case- each group containing 50 patients. Patients with ASA grade I and II, females aged 40 to 60 years were included. Parameters like age, ASA grade, duration of surgery, 1st analgesic requirement, postoperative pain using visual analogue scale, total consumption of opioid, and side effects were noted and compared between two groups.

### Results

There is no significant difference in the mean age, ASA grade and duration of surgery between the two groups of patients. Postoperative VAS scores were

significantly less among patients who were given Gabapentin. Mean total fentanyl consumption was significantly less in patients who were given gabapentin. Side effects were more in Gabapentin group patients.

**Conclusion**

Gabapentin is an effective, non-invasive adjuvant to epidural analgesia among patients scheduled for total abdominal hysterectomy.

**Keywords**

Case-control study, Efficacy, Gabapentin, Hysterectomy, Pre-emptive analgesia

## INTRODUCTION

Management of pain is a vital component in the postoperative care of patients after surgery. There are various therapeutic options to tacklepost-operative pain. They include pharmacological and non-pharmacological methods. Pharmacological includes the usage of non-steroidal anti-inflammatory drugs (NSAIDs), opioids, injection of local anaesthetics at the incisional site, adding certain adjuvants to spinal or epidural analgesia like clonidine or dexmedetomidine. But all pharmacological methods have side effects. Opioids can cause nausea/vomiting, constipation, miosis, sedation and respiratory depression. NSAIDS can cause hemostatic, renal, and gastrointestinal side effects.[1–5]The current postoperative pain management mainly aims at providing effective pain relief and reducing the requirements of opioid by giving two or more drugs for providing analgesia, which is -called multimodal analgesia.[6]Also, reduced requirement for opioids significantly reduces the incidence of side effects. Gabapentin has now become an integral part of multimodal analgesia along with opioids. Turan et al showed that neuropathic pain reliver like gabapentin, when added as an adjuvant to general anaesthesia can decrease postoperative pain and opioid consumption after total abdominal hysterectomy.[7] Many other studies compared oral gabapentin with a placebo to decrease pain after abdominal surgeries.[8–10]In spite of various previous studies and different analgesic techniques available, pain relief was still found to be inadequate in many patients in our tertiary care centre. Hence the current study was taken up.

## AIM

To assess the effect of oral gabapentin on postoperative pain among patients undergoing total abdominal hysterectomy under epidural anaesthesia

## MATERIALS AND METHODS

Source of data: This comparative and omized case-controlled study was done on patients scheduled for elective total abdominal hysterectomy (TAH)at a tertiary care centre named Katuri medical college & hospital, Guntur, Andhra Pradesh, from January 2022 to December 2022.

## ELIGIBILITY CRITERIA

### Inclusion Criteria

- Patients aged 40 to 60 years
- Females with ASA grade I and II
- Patients scheduled for elective TAH under epidural anaesthesia.
- Patients who provided informed consent to participate in the study.

### Exclusion Criteria

- Patients with coagulation abnormalities
- Pregnant and lactating women
- Patients with bradycardia, and ischemic heart disease.
- Patients with previous known allergies to gabapentin and fentanyl.
- Patients using anticonvulsant drugs

- Patients with a history of pelvic surgeries.
- Patients with incomplete data

Sampling: Simple random sampling method was used to select study population.

**SAMPLE SIZE CALCULATION**

As per the previous study, [11]based on opioid consumption difference in 12 hours between two groups, at a power of 80% and at a significance level of 5%, the minimum sample size came to be 84. So, we included 100 patients in our study.

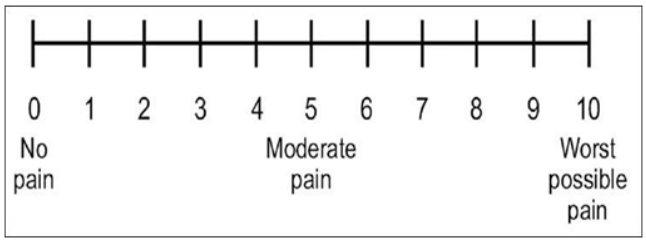
Parameters assessed

- Age
- ASA grade
- Duration of surgery
- Postoperative pain
- 1st request for rescue analgesia
- Total opioid (fentanyl consumption).

Pain assessment was done using visual analogue scale (VAS), which is a11-pointnt scale with scores ranging from 0 to 10.

0 indicates no pain and 10 indicates worst pain as shown below:

Figure 1 shows VAS score[12]




**GROUPS**

100 patients were divided into two groups by randomization using computer-generated software. The study is single-blinded in which, patients don't know which group they belong to. Group G included 50 patients who were given gabapentin 1 hour before surgery. Group C included 50 control patients who were given a placebo, which looked similar to the capsule of gabapentin.

Doses: Group G: One Gabapentin capsule in the dose of 600mg was given

Group C: Same-sized sugar-containing capsule was given 1 hour before surgery as placebo for control group patients.

After taking informed consent from each subject, case proforma was used to collect the data. Data was subjected to analysis and conclusion was drawn.

**TECHNIQUE**

After getting written informed consent was obtained from the patients, the study was conducted. On arrival to the operation theatre, ASA monitors were connected. Using an 18 gauzeIV cannula in the right hand under aseptic conditions, ringers lactate solution infusion was started. Pulse oximeter, non-invasive blood pressure, ECG and baseline vital signs were recorded. All patients received epidural anaesthesia. Patients were kept in left lateral position. T10- T11 interspace was identified and skin infiltration was done using local anaesthetic. An epidural catheter was secured and 5cm of the catheter was left inside epidural space and then the Tuohy needle was withdrawn. Test dose was injected into space. Each patient was given 15ml of 0.75% of Ropivacaine. 30mcg Fentanyl was used as rescue analgesic along

with 10ml of normal saline, which was given through epidural catheter. This was noted as first analgesic requirement time. Post operative pain scores were monitored for 12 hours.

**Statistical Analysis**

Data analysis was done using Microsoft excel 2019 office version. The results were expressed as mean ± S.D, percentages, and numerical parameters were compared using students t-test between patients of two groups. Categorical parameters were compared using chi square test.

P value < 0.05 was considered significant.

**Ethical considerations**

Informed consent form was taken from every subject who participated in the study.

**RESULTS**

**Demography**

**Age**

There is no significant difference in the mean age of patients of both groups as per t test (p=0.95). Hence there is no age-related bias.

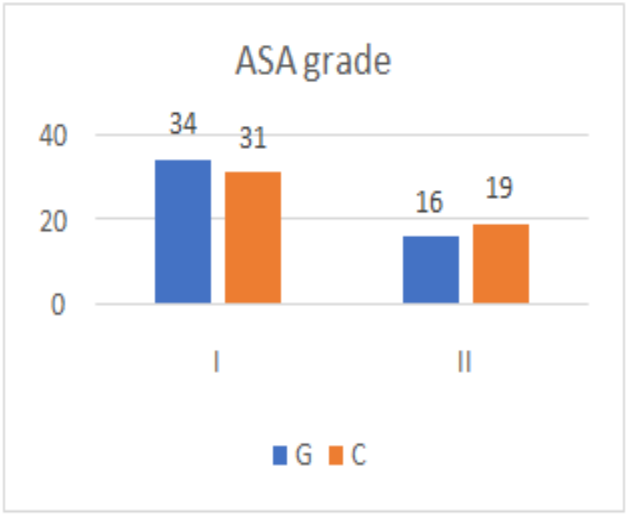
| Groups | Mean age | P value |
|---|---|---|
| G | 52.3±9.28 | 0.95 |
| C | 53.1±10.2 | |

Table 1 illustrates mean age of patients in both groups

**ASA Grade**

There is no signfiicant difference in ASA grade of patients of both groups(p=0.52).

Graph 1 shows ASA grade of patients:



**DURATION OF SURGERY**

There is no significant difference in the mean duration of surgery in both groups.

Table 2 shows duration of surgery

| Duration of surgery | Group G | Group C |
|---|---|---|
| Mean±SD | 88.42±4.76 | 89.2±8.23 |
| P value | 0.93 | |

**POST OPERATIVE PAIN**

There is significant difference in the mean post-operative pain between both groups at various intervals.

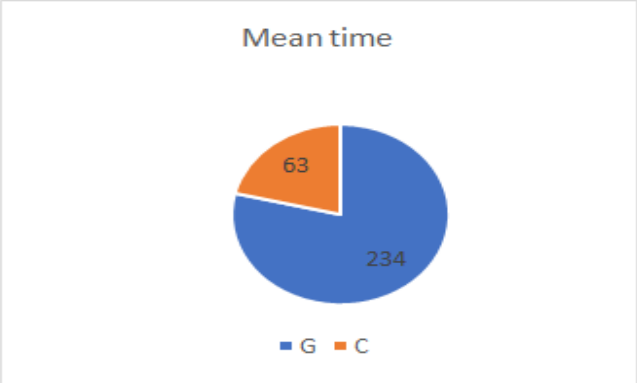
Table 3: Shows VAS scores at various intervals

| Post operative pain Mean VAS score | G | C | P value |
|---|---|---|---|
| Immediately after surgery or baseline | 3.2 ± 1.4 | 4.4±1.2 | 0.001 |
| 6 hours | 2.2±1.2 | 3.1±1.8 | 0.001 |
| 12 hours | 1.9 ± 1.0 | 2.1±1.2 | 0.001 |
| 24 hours | 0.9±0.05 | 1.8±0.8 | 0.001 |

**1st analgesia requirement time**

There is a significant difference in the 1st analgesia request time (p=0.001). Less time was required for control group patients.

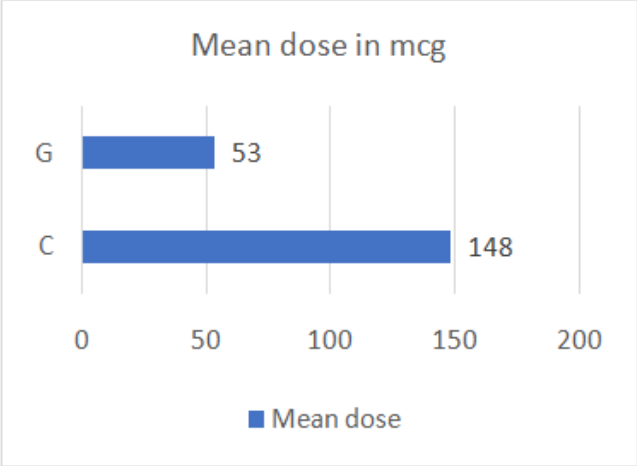
Graph 2 shows 1st analgesia requirement time



**Mean fentanyl consumption**

Mean dose of fentanyl consumed is significantly more in group G patients compared to group C patients. (p=0.001).

Graph 3 shows mean fentanyl consumption




**SIDE EFFECTS**

Side effects are more in gabapentin group patients.

Table 4 shows the side effects in both groups

| Side effects | Group G | Group C |
|---|---|---|
| Sedation | 28% | 16% |
| Dizziness | 24% | 12% |
| Nausea/vomiting | 12 | 10% |

**DISCUSSION**

In the current study, we identified the role of Oral Gabapentin in reducing postoperative pain among females scheduled for TAH. Patients were randomized into gabapentin(case) and control or placebo groups. There is no significant difference in mean age, ASA grade and duration of surgery between two groups of patients. Postoperative VAS scores were significantly less among patients who were given Gabapentin. Mean total fentanyl consumption was significantly less in patients who were given gabapentin. Side effects were more in Gabapentin group patients. In the study done by **Sujay et al**[13] 84 patients were included. They were divided into gabapentin and placebo groups. It was found that oral pre-emptive Gabapentin decreased postoperative pain significantly compared to placebo, similar to our study results.

**Clivatti J**[14]found that opioid consumption was reduced among 82.4% of subjects who received single preoperative dose of gabapentin.

**Parikh et al.**[15] did a study on 60 patients scheduled for upper abdominal surgeries. Patients were divided

into placebo and gabapentin groups. The dose of Gabapentin used in their study was 600mg, similar to our study. VAS scores were significantly less in patients of Gabapentin at 2,4,6,8,12, and 24 hours of the postoperative period. This finding was similar to our study findings.

**Bafna et al**[16] did a study on 90 patients with ASA grade I and II scheduled for gynaecological surgeries. Patients were divided into placebo group, gabapentin 150mg and gabapentin 600mg groups. More duration of effective analgesia was seen in patients of Gabapentin 600mg group. Mean numbers of doses of rescue analgesia during 1st 24 hours was significantly less in 600mg Gabapentin group.

Few studies showed that in animal models of nociception, gabapentin decreased the hypersensitivity associated with inflammation, and pain after surgery.[17-18]

**CONCLUSION**

Pre-emptive administration of Gabapentin 600mg significantly reduced post-operative pain among patients scheduled for TAH, and prolonged the time for which patient required rescue analgesia. Amount of opioid used was significantly reduced. We conclude that Gabapentin is an effective, non-invasive adjuvant to epidural analgesia.

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