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Research Article

Preoperative Oral Gabapentin Provides No Difference in Pain Scores Post Operatively

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Abstract

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Objective: The objective of this pain study is to assess the efficacy and safety of one time dose of preoperative gabapentin on the postoperative outcomes after total knee replacement.

Research Design/ Methods: A randomized, placebo-controlled, double-blind study evaluated efficacy of 1200mg gabapentin administered 1 hour before knee surgery. The surgical procedure was performed by the same surgeon and all patients post-operatively received opioid by patient-controlled analgesia. Patients reported pain intensities were recorded every shift by numeric (0-10) pain scores. Distance ambulated with physical therapy, joint flexion, and opioid related side effects were recorded.

Results: Opioid consumption at 18 hours and 36 hours was trending toward less in the gabapentin group, but did not reach a clinically significant difference ($p > 0.05$). Ambulation distance, pain scores, and knee flexion were no different in either study group. There were no differences between groups in adverse effects.

Conclusion: Preoperative oral gabapentin indicated a trend toward opioid sparing effects without an impact on postoperative ambulation.

This randomized, controlled trial examined the effects of preoperative oral gabapentin 1200 mg on postoperative pain and opioid consumption. This small study indicates a trend that preoperative oral gabapentin is opioid sparing in the immediate hours after total knee replacement surgery.

INTRODUCTION

During the immediate 48-72 hours after surgery, postoperative pain may be severe and adequate pain management requires multi-modal therapy [1,2]. In recent meta-analysis, 11% of post operative patients experience severe pain [1]. Opioid sparing effects, that is, reducing the amount of opioid needed by using an additional mechanisms of action to treat pain, may reduce complication rates the recovery period; and currently. Opioids are number three in the top ten medications involved in fatal overdoses [3]. Reducing the amount of opioid needed in high risk patient groups such as obstructive sleep apnea may help reduce complications during the hospital stay [4]. Because of the multiplicity of mechanisms involved in postoperative pain, a multimodal analgesia regimen, with a combination of opioid and non-opioid analgesic drugs is often used to enhance analgesic efficacy and reduce opioid requirements and side effects. With recent adverse event reports among the nonsteroidal anti-inflammatory agents (NSAIDs), the use of this class of analgesics is less preferred and studies evaluating the efficacy of other nonopioid analgesic modalities are needed [5,6].

Gabapentin, a structural analog of γ-aminobutyric acid, is used as an anticonvulsant drug. In addition, it has been effective in neuropathic pain, diabetic neuropathy, postherpetic neuralgia, and reflex sympathetic dystrophy [7-9]. Pretreatment with gabapentin can block the development of hyperalgesia [10]. Studies have demonstrated that mechanical hyperalgesia surrounding the wound in postoperative patients and experimentally, heat-induced, secondary hyperalgesia share a common mechanism and that central neuronal sensitization contributes to postoperative pain [8]. Gabapentin has a selective effect on the nociceptive process involving central sensitization [11].

Gabapentin and morphine have synergistic analgesic effects in animals and in humans [12]. In a recent meta-analysis, a single dose of oral gabapentin reduced postoperative morphine consumption and movement-related pain after radical mastectomy [13].

The aim of the present study was to determine the effect of gabapentin on postoperative pain and on PCA tramadol consumption in patients after abdominal hysterectomy.

METHODS

After obtaining the approval of the Institutional Review Board and written informed consent from the patients, 24 patients, ASA physical status I–II, undergoing elective total knee replacement were studied. Patients were eligible for participation if they were at least 18 yr old, reported no allergy to gabapentin, not pregnant or breast feeding, and not using sustained release opioid for a chronic pain condition other than for knee pain.

In this double blinded study, twenty four patients were randomized into a control group or gabapentin group resulting in 12 patients in each group. The control group received a placebo which appeared identical to the 1200mg gabapentin dosage form. Patients received the placebo or gabapentin 1 hour prior to surgery.

Anesthesia was induced by the same anesthesiologist in each patient with propofol and maintained with desflurane, propofol and fentanyl. Local anesthetic in all cases consisted of local femoral nerve block with 1.5% mepivacaine 20ml & 0.5% ropivacaine 20ml. The total knee replacement procedure was preformed by the same surgeon in all patients.

Post-operatively the patients received opioid by patient-controlled analgesia. The amount of opioid, acetaminophen, and NSAIDs were recorded in each patient. Patients reported pain intensities were recorded every shift by numeric (0-10) pain scores. The scores were assessed while at rest and at 8 hour intervals. Distance ambulated with physical therapy, joint flexion, and opioid related side effects were also recorded. The occurrence of any side effects, such as nausea and vomiting, constipation, respiratory depression, dizziness, somnolence, peripheral edema, diarrhea, headache, and pruritus was recorded.

Table 1: Patient Characteristics and Demographics (No clinical significant differences).

	Control n = 12 (%)	Gabapentin n = 12 (%)
Female gender	10 (83.3)	10 (83.3)
Body Mass Index > 35	7 (58.3)	4 (33.3)
Age (mean)	65.3	69.7
Hours in Recovery Room	2.5	2.5
Acetaminophen*	(100)	(100)
NSAIDs*	(80)	(80)

*The percentage of patients in each study group receiving this analgesic.

Table 2: Average Numeric Pain Scores 0 – 10.

	Control n = 12 (SD)	Gabapentin n = 12 (SD)
Day of Surgery	3.6 (2.3)	3.5 (2.2)
Post Op day 1	2.7 (1.5)	2.1 (1.6)

RESULTS

Twenty four consecutive patients who fulfilled the inclusion criterion were included in the study. All the patients allocated were able to complete the study. The groups were comparable with respect to gender distribution, body mass index, age time in recovery room, and the use of other non-opioid analgesics (Table 1). The numeric scores (0 being no pain and 10 extremely severe pain) were slightly less in gabapentin group on the day of surgery and on post operative day 1; however, with the small number of patients this did not equate to a clinical significant difference. (Table 2). Sedation scores were similar at all the measured times in the gabapentin and placebo groups.

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