VOLUME-8, ISSUE-2, FEBRUARY-2019 • PRINT ISSN No 2277 - 8160

Original Research Paper

Anaesthesiology

COMPARISON BETWEEN DULOXETINE AND GABAPENTINFOR POSTOPERATIVE PAIN RELIEF

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ABSTRACT

Background: Postoperative pain management has been a burning topic of research so as to ensure patient comfort and alleviation of fear and anxiety.Duloxetine and Gabapentin have been used in various dosages and combination for pain management . This study is conducted to commpare the efficacy inpost –operative pain relief.

Methods :A hospital based,prospective randomized comparative study in women undergoing hysterctomyin which70 female patients for hysterctomy were divided into two groups. Group A patients were administerd 60 mg duloxetine orally and Group B subjects were given 900 mg gabapentin orally 2 hours prior to surgery andthe results were compared.

Coclusion : Duloxetine and gabapentin both reduced postoperative opid consumption and NRS score. Gabapentin offered better pain relief tham duloxetine and reduces the nausea and voiting but causes more sedation

KEYWORDS : Duloxetine,Gabpentin, Postoperative pain, Pain relief

INTRODUCTION :

The recovery after surgery and response to general anaesthesia is different in either sex. Women's recovery after surgery is poor despite emerging faster from general anaesthesia.[1]..This could be because of greater prospensityforpain and opoid -related side-effects[2-6]..Hysterectomy is a conmmon surgical procedure in women resulting in significant pain and slow recovery.[7-9]. Various pharmaceutical stratigies have been tried to improve global quality of recovery.

Duloxetine is commonly used for the treatment of major depression and anxiety. It acts by inhibiting reuptake of serotinin-norepinephrine.[10].It's useful in treating chronic pain conditions such as osteoarthritis and musculoskeletal pain[11].It has also been tried for relief of post- surgical pain.It has got perioperative analgesic effect and also might prevent transient emotional problems.The combination of reduced pain and better emotional status can result in better independent state after surgery.[12].

Gabapentin, a structral analogue of -aminobutyric-acid was earlier used an anticonvultant in late 1980s with poor results.[13]. It showed promising results for chronic pain conditions and by late 1990s became first-line treatment for the patients suffering from chronic neuropathic pain.[14-15]. Presently, it's been widely used as an adjuct for treatment for post-surgical pain. Sevaral meta-analysis have confirmed the effficacy of gabapentin in decreasing post-operative opoid use and pain.[16-18].

Gabapentin acts by binding to -2-subunitsof voltage-dependant-calcium channels in activated neurons,which reduce the voltage-dependent-calcium channels.[19-20].Gabapentin disrupts the interaction between the thromobospondins and the alph-2-delta subunits resulting in reduced synapse formation.[21].The disruption may contribute to the analgesic effect of gabapentin,particularlyfor tratment for chroniic pain.

The present study was conducted with the objective of comparison of efficacy of duloxteine with gabapentin given orally preoperatively in managing post-operative pain with reduction of opoid requirements and the quality of pain-relief inpatients undergoing hysterectomy.

METHODS :

The study was a prospective randomozed,blindstudy conducted after approval of hospital-ethical-committe of MMU Medical college.Written informed consent was obtained from all partcipating patients. Patients included werefemale patients,30-60 years of age, undergoing hysterctomy (abddominal or vaginal) for benign diseases(ASA Physical status I-III). Subjects were excluded if they were allergic to duloxetine or gabapentin,pregnant, unable to understand the informed consent, had renal and/or liver disease,were taking chronic opoids and/or antidepressants.The subjects were randomized by random numbering prescribed in the envelop..They were either to receive duloxetine 60 mg(orally)or gabapentin 900mg (orally)

1-2 hrs before the surgical procedure.and at 24 hours after the surgical procedure.

After arrival in the operation theatre , standard ASA monitors were applied.Patients were started with normal saline by drip using 18-gauge cannula and were placed in a sitting position. After the lumber-site was prepared and draped in a sterile manner,topical anesthesia of 2% lignocaine was given for skin anaesthesia. In the combined spinal-epidural block, epdural catheter 18G was placedat the L3 or L4 interspace andwith 25/25 G spinal needle intrathecally,15-17.5 mg Bupivacaine 0.5 %was given after confirmation by the clear flow of the CSF.After confirmation of the appropriate dermatome level of blockage (T6) level, the surgeons were allowed to procceed.Patients were adminsteredmephentrine (6mg) i.v titrated to keep BP within 20% of the baseline value.In the post-anesthesia-care unit (PACU) ,subjects were asked to rate thepain on arrival by numeric rating scale (NRS) where 0 means no pain and 10 is the worst pain imaginable. .They were given narcotic epidurally (tramodol 100 mg) when pain was >5(NRS). Nausea was assesed at the same interval.Number of vomiting episodes were recorded.PONV was treated with ondasetrone 4mg i.v.

Perioperative data included the subjects age,height,weight, ASA physical status, surgery done.The Quality Of Recovery-40 questions (QOR-40) were compiled by the subjects at 24 and 48 hours after the sugery. The QOR-40 scoring systemwas explained to all the patientsand reviewed to provide accurate understanding of all questions. The questions evaluate 5 components of patient recovery , physical comfort (12 questions),physical independance(5 questions),emotional state (9 questions),psycholigical support(7questions)and pain (questions). The sum of these generates an aggregate score Global QOR-40 score range from 40-200.The *primary outcome* was the QOR -40 SCORE at 24 hours.and 48 hours.The *secondary outcome* was the postoperative pain scores and opiod consumption.Parameters observed were the number of times the analgesia by epidural route was given to alleviate the severe pain..Pain scale (by NRS {0-10}) at interval of ! hour, 2 hours,4 hours,8 hours ,12 hours,24 hours. The results were

collected,tabulated, and staistically analysed.A p-value was used to reject type I errror.

A p- value 0f <0.5 was considered statistically significant.

RESULTS AND OBSERVATIONS :

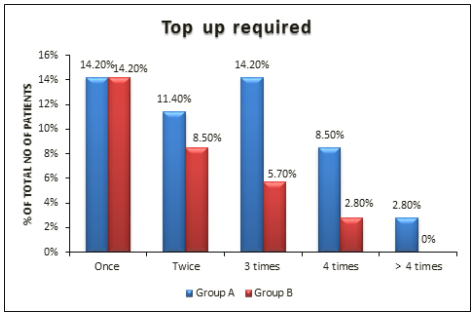
GROUP A (n=35) DULOXETINE (60 mg)
Group B (n = 35) GABAPENTIN (900 mg)

Opoid top-ups were required in 18 patients in Group Aand 11 patients in group B . The breakup is shown in Table 1.

Table 1.

Top up required	Group A	Group B	P value
Once	14.20%	14.20%	0.753
Twice	11.40%	8.50%	
3 times	14.20%	5.70%	
4 times	8.50%	2.80%	
> 4 times	2.80%	0%	
Total	51.4%	31.4%	

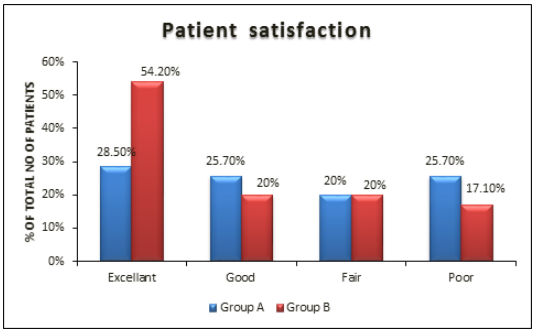
Total opoid consumption was reduced at 24 hours in the group B more than the Group A (11 verses 18) {p 0.753 }.51.4 % in Group A and 31.4% in Group B required Opoid top- ups in the postoperative period , thus proving that Gabapentin provided better postoperative analgesia as compared to Duloxetine.



When comparing the patient satisfaction as based on pain scores in the postoperative period , the results were as follows :

Table 2.

Patient satisfaction	Group A	Group B	P value
Excellent	28.50%	54.20%	0.155
Good	25.70%	20%	
Fair	20%	20%	
Poor	25.70%	17.10%	
Total	100.00%	100.00%	

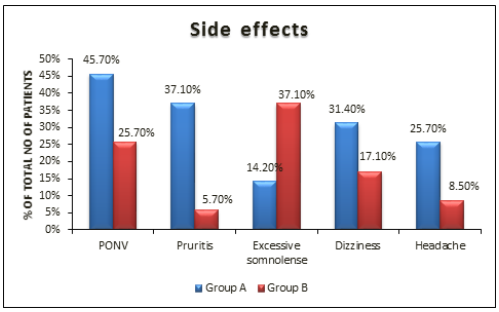


Overall patient satisfaction was in Gabapentin group than Duloxetine group at 24 hours after the surgery.

The median difference (95 % confidence interval)in global recovery scores (quality of recovery-40) at 24 hours after surgical procedure between the duloxetine group A and gabapentin group B was 9.(4-20)($p < 0.001$) and was found to be significant.

Table 3.

Side effects	Group A Number	Group A %	Group B Number	Group B %	P value
PONV	16	45.7 %	9	25.7 %	0.134
Pruritis	10	37.1 %	2	5.7 %	0.023
Excessive sedation	5	14.2 %	13	37.1 %	0.056
Dizziness	11	31.4 %	6	17 %	0.265
Headache	9	25.7 %	3	8.5 %	0.11



Side effects were observed more inGroup A in terms of nausea,vomiting,dizzines,headache,and pruritis whereas excessive sedation was observed more in Group B {Gabapentin }(37.1%).

The most common side effect observed was postoperative nausea and vomiting which was seen in 45.7%in Group A and 25.7 % in Group B patients and was relieved with 4 mg intravenous administration of Ondasetrone.

Discussion :

QOR-40 has become standard measurement tool for post-op recovery. In our study, it has been found, both duloxetine and gabapentin gave better qualitity of recovery after hyterectomy, especially: improvement of physical comfort , independence, emotional and painsubcomponents of quality of recovery scores, The postoperative opoid consumption and pain ratings was statistically reduced in the gabapentin group in comparison to duloxetine group.

Lucas J.et al found duloxetine improves postoperative quality of recovery undergoing abdominal hysterectomy[12]. HO K et al stated a greater sparing effect of duloxetine after knee replacement surgery[22]. In our study, there was a reduction in the narcotic requirement..A number of studies have established gabapentin as a potiential pain-reducing agent in postoperative period when given preoperatively[32].(Tippana et.al) In our study , there was reduction in demand for narcotic.In addition,the quality of recovery was better with gabapentin.Besides reducing postoperative pain, also leads to decrease in nausea, vomiting and pruritis after surgery.[43-45].None of our patients were given any antiemetic peroperatively for prevention of nausea and vomiting. In this study, the incidence of nausea and vomiting was lower in gabapentin group and it was relieved by i.v. ondastrone. The main side-effect of gabapentin was excesiive sedation as reported in a number studies done earlier also.The present investigation showed the quality of recovery was better in patients who received gabapentin (900mg) 1-2 hours before surgery than who were given duloxetine(60mg)1-2 hours before the surgery. These drugs were repeated after 24 hours also. The limitation of the study is that it is restricted to hysterectomy only and other surgeries are not included.

CONCLUSION :

In summary,duloxetine and gabapentin both improve postoperative quality of recovery in women undergoing hysterectomy in the presence of a multimodal analgesic strategy,especially,gabapentin which reduced postoperative opioid consumption to a greater extent as compared to duloxetine,although, the dose related side–effects like

sedation,dizziness and confusion were seen in the Gabapentin group. Therefore, duloxetine and gabpentin should be considered an effective strategy for improving the postoperative quality of recovery and reduce the post-surgical narcotic consumption in patients undergoing hysterectomy.

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