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ORIGINAL ARTICLE

A comparative analysis of effects of gabapentin and alprazolam on post-operative analgesia

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ABSTRACT:

Background: Anxiety leads to a surge of catecholamines associated with the stress response leading to tachycardia, hypertension and haemodynamic instability. The present study was conducted to compare effects of gabapentin and alprazolam on post operative analgesia. **Materials & Methods:** 120 patients with American Society of Anesthesiologists Physical status 1 or 2 of both genders scheduled for elective abdominal hysterectomywere divided into 3 groups of 40 each. Group I received oral gabapentin 600 mg, group II received oral 0.5 mg alprazolam and group III placebo – oral B-complex forte with Vitamin C 1 capsule. The anxiety and post-operative pain was assessed using visual analogue scale. **Results:** Group I had 22 males and 18 females, group II had 19 males and 21 females and group III had 17 males and 23 females. The mean duration of surgery in group I was 152.2 minutes, in group II was 160.2 minutes and in group III was 152.8 minutes. Anxiety score before pre- medication was 25 in group I, 35 in group II and 32 in group III and after pre- medication was 20 in group I, 19 in group II and 25 in group II. VAS score at 1 hour was 54.4, 71.3 and 75.8, at 2 hours was 42.2, 62.4and 60.4, at 6 hours was 34.5, 34.6 and 42.6 and at 24 hours was 26.4, 15.4 and 18.2 respectively. The difference was significant (P< 0.05).Ramsaysedationscore (h) at 1 hour was 3, 2 and 2, at 2 hours was 2, 2 and 2, at 6 hours was 2, 2 and 2 and at 24 hours was 2, 2 and 2 in group I, II and III respectively. The difference was non- significant (P> 0.05). **Conclusion:** Alprazolam as premedication was found to be an effective anxiolytic in the pre-operative period as compared to gabapentin.

Key words: Alprazolam, Anxiety, Gabapentin, premedication

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INTRODUCTION

Anxiety leads to a surge of catecholamines associated with the stress response leading to tachycardia, hypertension and haemodynamic instability. Despite intensive investigation, the molecular mechanism of action of gabapentin remains unsettled.[1,2] In healthy volunteers, gabapentin enhanced the effect of morphine in the cold pressor test, reduced primary mechanical allodynia in acute inflammation following a thermal injury, and reduced secondary hyperalgesia following sensitization with combined heat and capsaicin, without affecting acute nociceptive thresholds.[3]

Gabapentin, a structural analogue of gamma amino butyric acid, is used as an analgesic adjunct to reduce the post-operative pain and post-operative morphine consumption.Initially introduced as an antiepileptic, it soon found use in treating neuropathic pain associated with post-herpetic neuralgia, post-poliomyelitis neuropathy and reflex sympathetic dystrophy.[4] It has been suggested that central neuronal sensitization may amplify postoperative pain, although the relative contribution of various pain mechanisms to post-operative pain has not been established.[6]Alprazolam, a triazolo-analog of the 1,4 benzodiazepine is a widely used pre-operative anxiolytic drug in anaesthetic practice.[5] The present study was conducted to compare effects of gabapentin and alprazolam on post-operative analgesia.

MATERIALS & METHODS

The present study comprised of120patients with American Society of Anesthesiologists Physical status 1 or 2 of both genders scheduled for elective abdominal hysterectomy. All patients gave their written consent for participation in the study.

Data such as name, age, gender etc. was recorded. Patients were divided into 3 groups of 40 each. Group I received oral gabapentin 600 mg, group II received oral0.5 mg alprazolam and group III placebo – oral B-complex forte with Vitamin C 1 capsule. Patients received premedication with sips of water, on the night prior to surgery and 2 hours prior to surgery. The anxiety and post-operative pain was assessed using visual analogue scale (VAS).Results thus obtained were assessed statistically. P value <0.05 was considered significant.

RESULTS

Table I: Distribution of patients

Groups	Group I	Group II	Group III
Agent	600 mg Gabapentin	0.5 mg Alprazolam	B-complex forte with Vitamin C 1
M:F	22:18	19:21	17:23

Table I shows that group I had 22 males and 18 females, group II had 19 males and 21 females and group III had 17 males and 23 females.

Table II: Assessment of parameters

Parameters	Variables	Group I	Group II	Group III	P value
Duration of surgery (min)		156.2	160.2	152.8	0.91
Anxiety score	Before pre- medication	25	35	32	0.05
	After pre- medication	20	19	25	0.94
VAS	1 hour	54.4	71.3	75.8	0.05
	2 hours	42.2	62.4	60.4	0.16
	6 hours	34.5	34.6	42.6	0.11
	24 hours	26.4	15.4	18.2	0.72

Table II, graph I shows that mean duration of surgery in group I was 152.2 minutes, in group II was 160.2 minutes and in group III was 152.8 minutes. Anxiety score before pre- medication was 25 in group I, 35 in group II and 32 in group III and after pre- medication was 20 in group I, 19 in group II and 25 in group II. VAS score at 1 hour was 54.4, 71.3 and 75.8, at 2 hours was 42.2, 62.4 and 60.4, at 6 hours was 34.5, 34.6 and 42.6 and at 24 hours was 26.4, 15.4 and 18.2 respectively. The difference was significant (P< 0.05).

Graph I: Assessment of parameters

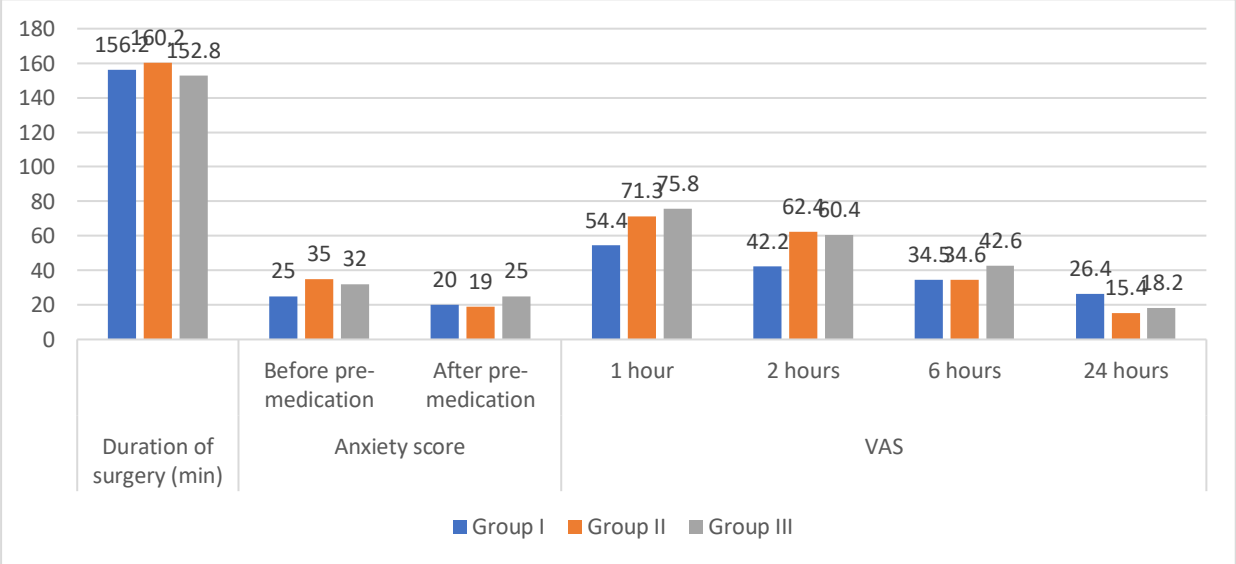

Table III: Comparison ofRamsay sedation score

Ramsaysedationscore (h)	Group I	Group II	Group III	P value
1 hour	3	2	2	0.97
2 hours	2	2	2	
6 hours	2	2	2	
24 hours	2	2	2	

Table III shows that Ramsaysedationscore (h) at 1 hour was 3, 2 and 2, at 2 hours was 2, 2 and 2, at 6 hours was 2, 2 and 2 and at 24 hours was 2, 2 and 2 in group I, II and III respectively.The difference was non- significant (P> 0.05).

DISCUSSION

The relationship between anxiety and pain has been identified.[6] Psychological stress, measured over several post-operative days, revealed that anxiety and pain are well correlated. Thus, alleviation of pre-operative anxiety as an adjunct to post-operative pain management seems a promising approach.[7,8] Gabapentin has demonstrated potent anti-hyperalgesic properties in preclinical and clinical studies, without affecting acute nociception.[9,10] In experimental

studies, gabapentin suppressed experimentally induced hyperalgesia. Intrathecal administration reduced tactile allodynia after incisionenhanced pain behavior in rats after formalin induced pain, and reduced mechanical hyperalgesia in a rat model of postoperative pain.[11]

We found that group I had 22 males and 18 females, group II had 19 males and 21 females and group III had 17 males and 23 females. Dirks et al[12] in their study 70 patients received a single dose of oral gabapentin (1,200 mg) or placebo 1 hour before surgery. Patients received patient-controlled analgesia with morphine at doses of 2.5 mg with a lock-out time of 10 min for 4 hours postoperatively. Pain was assessed on a visual analog scale at rest and during movement, and side effects were assessed on a four-point verbal scale 2 and 4 h postoperatively. Results: Thirty-one patients in the gabapentin group and 34 patients in the placebo group completed the study. Gabapentin reduced total morphine consumption from a median of 29 to 15 (10–19) mg. Pain during movement was reduced from 41 to 22 mm at 2 hours postoperatively and from 31 to 9 mm at 4 h postoperatively ($P<0.018$). No significant differences between groups were observed with regard to pain at rest or side effects.

We found that group I had 22 males and 18 females, group II had 19 males and 21 females and group III had 17 males and 23 females. The mean duration of surgery in group I was 152.2 minutes, in group II was 160.2 minutes and in group III was 152.8 minutes. Anxiety score before pre- medication was 25 in group I, 35 in group II and 32 in group III and after pre-medication was 20 in group I, 19 in group II and 25 in group II. VAS score at 1 hour was 54.4, 71.3 and 75.8, at 2 hours was 42.2, 62.4 and 60.4, at 6 hours was 34.5, 34.6 and 42.6 and at 24 hours was 26.4, 15.4 and 18.2 respectively. Clarke et al[12] found that gabapentin 600 mg did not reduce the pre-operative anxiety compared to a placebo. In a randomized, double-blind, placebo-controlled, parallel-group trial, 300 mg pregabalin was compared to placebo and 400 mg ibuprofen using a dental pain model.

We found that Ramsaysedationscore (h) at 1 hour was 3, 2 and 2, at 2 hours was 2, 2 and 2, at 6 hours was 2, 2 and 2 and at 24 hours was 2, 2 and 2 in group I, II and III respectively.Menigaux et al[13] suggested the anxiolytic effect of gabapentin. A single drug providing pain relief as well as anxiolysis is desirable favouring better perioperative results.

CONCLUSION

Authors found that alprazolam as premedication was found to be an effective anxiolytic in the pre-operative period as compared to gabapentin.

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