

EFFECT OF PRE-EMPTIVE PREGABALIN IN PATIENTS UNDERGOING UPPER LIMB SURGERIES UNDER SUPRACLAVICULAR BLOCK: A RANDOMIZED CONTROLLED TRIAL

Sheena Sharma and *Dr. Mahesh Kumar

¹MD (Anaesthesia), Medical Officer (Specialist), Civil Hospital Dehra, District Kangra, Himachal Pradesh.²Specialist MD (Anaesthesia), Civil Hospital Thural, Kangra.***Corresponding Author: Dr. Mahesh Kumar**

Specialist MD (Anaesthesia), Civil Hospital Thural, Kangra.

Article Received on 30/03/2022

Article Revised on 20/04/2022

Article Accepted on 10/05/2022

ABSTRACT

Background and aims: Data are lacking on pre-emptive efficacy of pregabalin on block characteristics and pain during peripheral nerve blocks. The present study evaluated effect of pre-emptive pregabalin in patients undergoing upper limb surgeries under supraclavicular block. **Methods:** The patients aged 18-60 years of either sex, American Society of Anaesthesiologists (ASA) physical status I-II and BMI 18.5-29.9 kg/m² scheduled for scheduled for elective upper limb surgeries under supraclavicular block, were included over a period of 18 months in this study at Department of Anaesthesiology, Dr RPGMC Kangra at Tanda. Patients were randomly assigned to receive 150 mg of pregabalin (group PR) or placebo in the form of B complex tablets (group C) one hour before surgery. **Results:** There was no significant difference in onset of sensory and motor block between both groups (P>0.05). However, duration of sensory and motor block was significantly higher in group PR in comparison to group C (P<0.0001). We observed a significantly lower post-operative pain at 30-min, and 24-hours (P<0.001). Mean number of boluses used in group C was significantly higher in comparison to group PR (P<0.01). One patient was not satisfied in group C while 87% of the patients in group PR and 20% in group C were very satisfied. **Conclusion:** Hence, it may be recommended that pre-emptive oral pregabalin in the dose of 150 mg with lignocaine adrenaline in USG supraclavicular block in upper limb surgeries has superior analgesic efficacy over control.

KEYWORDS: Supraclavicular block, Pre-emptive, Pregabalin, Block.**INTRODUCTION**

Pre-emptive analgesia is defined as a treatment that is initiated before surgery in order to prevent the establishment of central sensitization evoked by the incisional and inflammatory injuries occurring during surgery and in the early postoperative period.^[1] Owing to this 'protective' effect on the nociceptive system, pre-emptive analgesia has the potential to be more effective than a similar analgesic treatment initiated after surgery. As a consequence, pre-emptive analgesia can reduce immediate postoperative pain and also prevent the development of chronic pain by decreasing the altered central sensory processing.^[2]

The indications for upper extremity peripheral nerve blocks are for surgical anaesthesia as well as post-operative pain management for surgeries involving either the upper arm or forearm. The supraclavicular is a great peripheral nerve block that encompasses the entire arm. The infraclavicular and the axillary nerve blocks are indicated for surgeries involving the elbow and below the elbow respectively.^[3,4]

Pregabalin is a lipophilic GABA analogue with anti-convulsant, anxiolytic and sleep modulating properties. Pregabalin was shown to be effective in neuropathic pain, incisional injury and inflammatory injury.^[5]

The randomized controlled trial was aimed to evaluate effect of pre-emptive pregabalin in patients undergoing upper limb surgeries under supraclavicular block.

METHODS

The patients aged 18-60 years of either sex, American Society of Anaesthesiologists (ASA) physical status I-II and BMI 18.5-29.9 kg/m² scheduled for scheduled for elective upper limb surgeries under supraclavicular block, were included over a period of 18 months in this study at Department of Anaesthesiology, Dr RPGMC Kangra at Tanda. Exclusion criteria were patient's refusal for block, patients with known drug allergy to study drugs, patients who had taken analgesics 48 hrs before, use of anti-epileptic drugs, hepatic and renal pathologies affecting drug clearance, history of long-term usage of NSAIDs and opioid analgesics, patient in whom the block effect was partial and required supplementary

analgesic, diabetes mellitus and other neuropathic disorders, any contraindications for peripheral nerve blocks, coagulopathy disorders, psychiatric disorders, and/or addiction to any drug.

The study was an open label randomized controlled study. It was commenced after obtaining approval of institutional ethics committee. Randomization was achieved using block randomization with block size of 30. Sequence was generated by a person not directly involved in execution of the study.

Pre-anaesthetic Evaluation

During pre-operative visits, patient's detailed history, general physical examination and systemic examination was carried out. Basic demographic data like age, sex, height, weight, BMI was recorded.

Routine investigations like hemoglobin, urine sugar, bleeding time, clotting time, renal function tests, liver function tests, Chest X-ray, ECG were done in all patients. Patients were explained in detail about the anaesthesia procedure. Written and informed consent was taken from the patients

Methodology

Table 1: Comparison of general characteristics.

	Group PR (n=30)	Group C (n=30)	P Value
Age (Years)	34.93±9.47	31.73±9.33	0.193
Sex, n			0.781
Male	20	21	
Female	10	9	
Weight (Kg)	63.46±9.19	66.73±8.17	0.151
ASA Grade, n			1.000
I	25	25	
II	5	5	
Duration of surgery (minutes)	131.83±27.57	119.10±18.89	0.041

Data expressed as mean±SD otherwise mentioned.

Block characteristics

There was no significant difference in onset of sensory and motor block between both groups ($P>0.05$).

Ninety patients were enrolled in the study with orthopedic fractures of the upper extremity who underwent surgery under supraclavicular nerve block. They were randomly assigned to receive 150 mg of pregabalin (group PR) or placebo in the form of B complex tablets (group C), one hour before surgery. All patients were kept NPO eight hours before the surgery. They were pre-medicated in the form of tablet alprazolam 0.25 mg and tablet ranitidine 150mg at bed time and 6:00 am with sip of water on the day of surgery.

Data analysis

Data were expressed as frequency, percentages, mean, and/or standard deviation. Categorical variables were compared using Chi square test. Student t-test was used to compare quantitative variables between 2 groups. P value <0.05 was considered significant. Statistical analysis was performed using SPSSv21.

RESULTS

General characteristics

Table 1 shows general characteristics of the study participants. The patients in both groups were comparable in terms of age, sex, weight, ASA physical status, and duration of surgery ($P>0.05$).

However, duration of sensory and motor block was significantly higher in group PR in comparison to group C ($P<0.0001$) (Table 2).

Table 2: Comparison of onset and duration of sensory and motor block.

	Group PR (n=30)	Group C (n=30)	P Value
Onset of sensory block	3.77±0.82	4.0±0.79	0.273
Onset of motor block	7.70±1.21	7.60±1.19	0.748
Duration of sensory block	269.50±11.09	128.0±6.01	<0.0001
Duration of motor block (hours)	231.33±12.45	98.07±11.24	<0.0001

Data were expressed as mean±SD

Post-operative pain score

We observed a significantly lower post-operative pain at 30-min, and 24-hours ($P<0.001$) (Table 3).

Table 3: Comparison of post-operative pain score.

	Group PR (n=30)	Group C (n=30)	P Value
30 min	1.61±0.95	4.14±0.78	<0.001
1-hour	2.01±0.55	0.60±0.33	<0.001
4-hour	4.28±0.75	4.60±1.33	0.256
24-hour	3.17±1.42	5.80±3.20	<0.001

Data were expressed as mean±SD

Requirement of rescue analgesia

Mean number of boluses used in group C was significantly higher in comparison to group PR ($P<0.01$) (Figure 1).

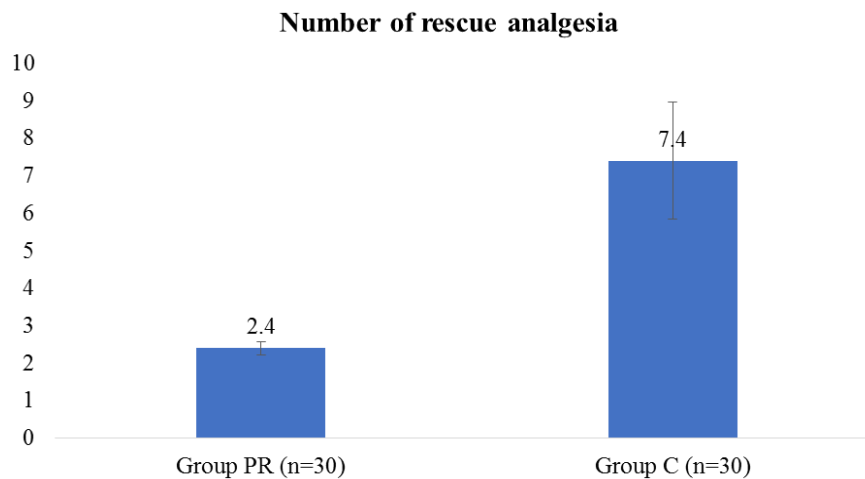


Figure 1: Comparison of mean rescue analgesics.

Patient satisfaction score

One patient was not satisfied in group C while 87% of the patients in group PR and 20% in group C were very satisfied (Figure 2).

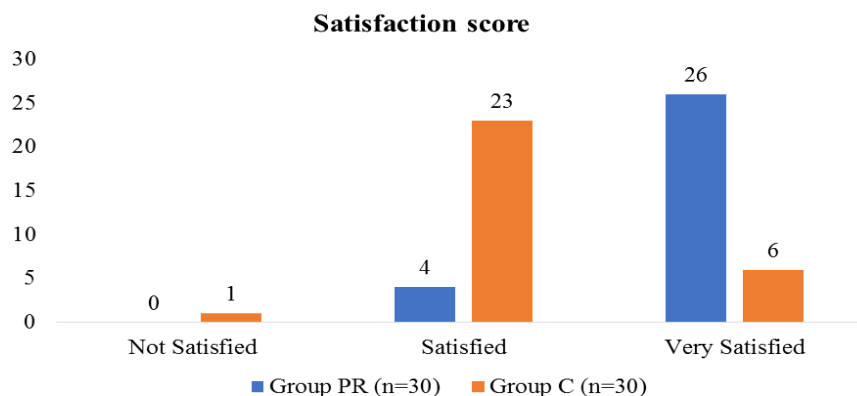


Figure 2: Distribution of patients with satisfaction score.

DISCUSSION

Our findings showed that pre-emptive pregabalin was superior over placebo in terms of higher duration of sensory and motor block, lesser pain, lesser requirement of rescue analgesics, and higher patients' satisfaction.

Farladansky et al found no clinically important

differences in the overall analgesic effectiveness of perioperative pregabalin administration compared with single-shot interscalene brachial plexus block, pain was significantly greater during the first postoperative hour. Nonetheless, this effect promptly resolved, presumably with the use of higher opioid doses during the first postoperative day.^[6]

Reuben et al. suggest that pregabalin can interact synergistically with COX-2 specific NSAIDs to reverse hyperalgesia associated with peripheral inflammation.^[7] The combination of pregabalin and NSAIDs was shown to be superior to either single drug alone for postoperative pain management. Therefore, the combination of pregabalin and diclofenac (1.5mg/kg i/m used as rescue analgesic in this study) also has synergistic effect on postoperative pain control in the group.

Omara et al. in spinal surgery, reported that pregabalin significantly decreased the VAS score at 4 hrs, 6 hrs, and 12 hrs postoperatively in comparison to placebo group⁵⁷ which are consistent with the present study results ($P < 0.0001$).

CONCLUSION

We conclude that pre-emptive oral pregabalin 150 mg and placebo had almost equal onset of sensory and motor block. There was increase in sensory and motor block duration in the pregabalin group. Post-operative rescue analgesic requirement was significantly lower in pregabalin compared with control control.

REFERENCES

1. Kissin I. Preemptive analgesia. *Anesthesiology*, 2000; 93: 1138–43.
2. Woolf CJ, Chong MS. Preemptive analgesia--treating postoperative pain by preventing the establishment of central sensitization. *Anesth Analg*, 1993; 77: 362–79.
3. Zhang Y, Cui B, Gong C, Tang Y, Zhou J, He Y, et al. A rat model of nerve stimulator-guided brachial plexus blockade. *Lab Anim*, 2019; 53: 160–8.
4. Vaid VN, Shukla A. Inter Scalene Block: Revisiting old technique. *Anesth Essays Res.*, 2018; 12: 344–8.
5. Field MJ, Oles RJ, Lewis AS, McCleary S, Hughes J, Singh L. Gabapentin (neurontin) and S-(+)-3-isobutylgaba represent a novel class of selective antihyperalgesic agents. *Br J Pharmacol*, 1997; 121: 1513–22.
6. Farladansky E, Hazan S, Maman E, Reuveni AM, Cattan A, Matot I, et al. Perioperative Oral Pregabalin Results in Postoperative Pain Scores Equivalent to Those of Interscalene Brachial Plexus Block After Arthroscopic Rotator Cuff Repair: A Randomized Clinical Trial. *Arthrosc J Arthrosc Relat Surg Off Publ Arthrosc Assoc N Am Int Arthrosc Assoc*, 2022; 38: 31–7.
7. Reuben SS, Buvanendran A, Kroin JS, Raghunathan K. The analgesic efficacy of celecoxib, pregabalin, and their combination for spinal fusion surgery. *Anesth Analg*, 2006; 103: 1271–7.