

**Original article:**

## Study of Tramadol in neuraxial anaesthesia : Observational study

<sup>1</sup>Dr Vinit C Sukhatankar\* , <sup>2</sup>Dr Bhumika Rangparia

<sup>1</sup>Associate Professor , Anaesthesia Department , Rural Medical College , Loni

<sup>2</sup>Resident , Anaesthesia Department , Rural Medical College , Loni

Corresponding author\*

### Abstract:

**Introduction:** Anaesthesia can be categorized into local, conscious sedation, regional and general anaesthesia (GA). Regional anaesthesia is further separated into central neuraxial block and peripheral nerve block. Regional anaesthesia is very safe and popular anesthetic technique for various surgeries. Shivering is an unpleasant and frequent complication in the perioperative period under neuraxial anaesthesia and around 40-60% of the patients under regional anaesthesia develop shivering

**Methodology:** Present Study was conducted on 390 Patients with 20 to 60 years of age, of either sex belonging to ASA I and II who underwent elective lower abdominal and lower limb surgeries under Spinal anaesthesia in P.R.H. LONI, who developed grade 3 and 4 shivering according to Wrench criteria after spinal anaesthesia and who were given tramadol for cessation of shivering.

**Results:** Mean time taken by Inj. Tramadol for cessation of shivering was  $1.84 \pm 0.94$ . Minimum time taken was 1 min by 46.92% patients and by 5 mins 100% of patients were free from shivering.

**Conclusion:** From this study , we may conclude that Tramadol is very effective drug for perioperative shivering under neuraxial anaesthesia.

### Introduction:

Anaesthesia can be categorized into local, conscious sedation, regional and general anaesthesia (GA). Regional anaesthesia is further separated into central neuraxial block and peripheral nerve block. Regional anaesthesia is very safe and popular anesthetic technique for various surgeries. Shivering is an unpleasant and frequent complication in the perioperative period under neuraxial anaesthesia and around 40-60% of the patients under regional anaesthesia develop shivering.<sup>[1]</sup> Shivering has mild form of having skin eruptions to a severe form with generalized continuous which is an involuntary, oscillatory muscular activity, is a physiological response to core hypothermia in an attempt to raise the metabolic heat production.

Exact causes of post spinal shivering are still unclear though various mechanisms have been postulated with some attributing it to a thermoregulatory response to hypothermia that causes temperature induced changes of neurons in the mesencephalic reticular formation and dorsolateral pontine and medullary reticular formation .<sup>[2]</sup> Prolonged impairment of thermoregulatory autonomic control under anaesthesia along with the cold environment of operating rooms and cold infusion fluids, contributes to a fall in core body temperature, and hence shivering.<sup>[1][3]</sup>

### Methodology:

Present Study was conducted on 390 Patients with 20 to 60 years of age, of either sex belonging to ASA I and II who underwent elective lower abdominal and lower limb surgeries under Spinal anaesthesia in P.R.H. LONI, who

developed grade 3 and 4 shivering according to Wrench criteria after spinal anesthesia and who were given tramadol for cessation of shivering.

A lumbar subarachnoid block was performed under strict aseptic precautions with the patient in the left lateral position with a pillow under the head and the table flat.

All patients were induced with 3 ml to 4 ml (according the height of patient) of 0.5% Bupivacaine (hyperbaric). Lumbar tap was made in the L3-4 inter-space, midline approach, using 25 Gauge Quincke needle. After obtaining clear flow of CSF, drug was injected slowly, after negative aspiration for blood. Patients were made to lie supine immediately after the completion of injection. Three hundred and ninety adult Patients with 20 to 60 years of age , of either sex belonging to ASA I and II who underwent elective lower abdominal and lower limb surgeries under Spinal anesthesia at P.R.H. LONI ,who developed grade III and IV shivering according to Wrench criteria and who developed grade III and IV shivering according to Wrench criteria after spinal anesthesia and who were given tramadol for cessation of shivering were selected for the observation.

### Results

The mean age was  $39.48 \pm 11.06$  years with a minimum age of 20 years and maximum age of 60 years . Patients are equally distributed among all age group except elderly patients are only 19%.

**Table 1: ASA status distribution**

| ASA Distribution | No of patient | %     |
|------------------|---------------|-------|
| ASA I            | 197           | 50.51 |
| ASA II           | 193           | 49.49 |
| P Value          | 0.4229        |       |

ASA I &II patients are almost equally in number .

The mean duration of surgery is  $89.22 \pm 15.03$  min with minimum duration of 52 min and maximum 124 min. Majority of patients were from group between 91-110 mins

**Table 2: Onset of shivering Distribution**

| ONSET OF SHIVERING (MIN) | NO. OF PATIENTS | %     |
|--------------------------|-----------------|-------|
| 0-5                      | 2               | 0.5   |
| 6-10                     | 63              | 16.15 |
| 11-15                    | 319             | 81.79 |
| 16-20                    | 4               | 1.02  |
| 21-25                    | 1               | 0.26  |
| 26-30                    | 1               | 0.26  |
| MEAN                     | 11.98           |       |
| S.D.                     | 1.99            |       |

**81.79 % of patients developed shivering between 11 to 15 mins .**

Mean time taken by Inj. Tramadol for cessation of shivering was  $1.84 \pm 0.94$ . Minimum time taken was 1 min by 46.92% patients and by 5 mins 100% of patients were free from shivering.

**Discussion:**

Variety of factors contributes to decrease the core body temperature in patients receiving spinal anesthesia. These include sympathetic block causing peripheral vasodilation, increase cutaneous blood flow resulting in increased heat loss through skin , cold operating room , rapid I.V. infusion of cold iv fluids , direct effect of cold anesthetic solution upon the thermo sensitive structure of spinal cord .<sup>[4]</sup>

It interferes with monitoring of electrocardiogram, blood pressure and pulse oximetry.<sup>[4]</sup> With post anesthesia shivering, left ventricular systolic work index is increased and oxygen consumption may be increased by 200% to 500% in patients under neuraxial anesthesia. Thus, in patients with decreased myocardial reserve, shivering may further compromise myocardial function. Shivering may also increase intraocular and intracranial pressures and may also contribute to increased wound pain.<sup>[5]</sup> **Kranke et al** concluded in their study that post anesthetic shivering is true medical problem which should be treated.<sup>[6]</sup>

Shivering can be treated by Non Pharmacological and Pharmacological methods. Equipment to maintain normothermia is effective in preventing shivering but may be expensive and it's not practical in all settings.<sup>[1]</sup> **Alfonsi P<sup>[5]</sup>** concluded in his study that Skin surface rewarming is a rapid way of obtaining the threshold shivering temperature while raising the skin temperature and improving the comfort of the patient. However, it is less efficient than certain drugs such as Meperidine, Clonidine or Tramadol, which act by reducing the shivering threshold

temperature.<sup>[7]</sup> Pharmacological agents remain the most popular mode of treatment for shivering. Many agents have been used to eliminate postoperative shivering such as meperidine, doxapram, tramadol, ketamin, clonidine, propofol, physostigmine and nefopam, dexamethasone, magnesium sulfate, and fentanyl, Ondansetron and butorphanol<sup>[7]</sup>

Tramadol is easily available and it has gained a reputation in many clinical trials for the control of shivering.<sup>[8]</sup> Tramadol is effective in the treatment of postanesthetic shivering.<sup>[2]</sup> **Zahedi H**<sup>[9]</sup> reported tramadol was most effective due to a faster onset, no recurrence of shivering, shorter duration of recovery, and fewer adverse effects. In our institute we found shivering is commonly faced complications in patients who were given central neuraxial anesthesia specially spinal anesthesia. As our institute is in rural area we found Tramadol as cost effective and easily available drug suitable for post anesthetic shivering as compare to other newer drugs. Hence we have chosen Tramadol as our study drug to observe its effectiveness and side effects if any in Rural Medical College.

#### **Conclusion:**

From this study, we may conclude that Tramadol is very effective drug for perioperative shivering under neuraxial anesthesia.

#### **References:**

1. Attal P, Chhaya A, Singh T, Upadhyaya RM. Comparison of clonidine and tramadol for the control of shivering under spinal anesthesia. *International Journal of Biomedical and Advance Research*. 15 Nov ;6(1).
2. Sahi S, Singh MR, Katyal S. Comparative efficacy of intravenous dexmedetomidine, clonidine, and tramadol in postanesthesia shivering. *J Anaesthesiol Clin Pharmacol* 2016;32:240-4.
3. Manouchehrian N, Mohammadin A, Sanie M, Tazeh-kand NF, Sanatkar M. A comparison of therapeutic effect of Tramadol & Meperidine for treatment of shivering after spinal anesthesia in elective caesarean section. *Archives of Anesthesiology & Critical Care*. 2015;1(2):50-54.
4. Shukla U, Malhotra K, Prabhakar T. A comparative study of clonidine and Tramadol on post spinal anesthesia shivering. *Indian J Anesth*. 2011;55:252-6.
5. Sharma M, Kharbujia K, Khadka B. Comparison of pethidine and tramadol for the control of shivering in patients undergoing elective surgery under spinal anesthesia. *Journal of Lumbini Medical College*. 2016;4(2):64-7.
6. Palan A, Agrawal N.K. Control of Intraoperative Shivering Under Spinal Anaesthesia- A Prospective Randomized Comparative Study of Butorphanol with Tramadol. *Journal of Krishna Institute of Medical Sciences University*. 2017;6(1):57-64.
7. Buggy D J, Crossley W A. Thermoregulation, Mild peri-operative hypothermia and post anesthetic shivering. *British journal of anesthesia*. 2000;84(54):615-28.
8. Yu-Chaun Tsai and Koung-Shing Chu. A comparison of Tramadol, amitriptyline and meperidine for postepidural anaesthetic shivering in parturients. *Anesth Analg* 2001;Aug;40(7):793:1288-1292.
9. Maheshwari BS, Shah SK, Chadha IA. Tramadol and butorphanol for control of shivering: Randomized double blind comparative study. *J. Anesth. Clin Pharmacol*. 2008;24(3):343-346.