

Efficacy of Prophylactic Low Dose Ketamine and Tramadol for Prevention of Shivering During Spinal Anaesthesia in Patients Undergoing Lower Abdominal Surgeries

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ABSTRACT

Aim: To compare the efficacy of prophylactic low dose ketamine and tramadol in terms of prevention of shivering during spinal anaesthesia in subjects undergoing lower abdominal surgeries.

Settings: Department of Anaesthesia & Intensive Care, CMH, Lahore

Duration of Study: From: January 2015 to June 2015.

Study Design: Randomized controlled trials

Results: In this study, mean±sd was calculated as 28.13±6.19 in Group-K and 28.41±5.97 years in Group-T while comparison of efficacy in both groups was recorded which shows that 6(18.75%) in Group-K and 15(46.88%) in Group-T while remaining 26(81.5%) in Group-K and 17(53.12%) in Group-T were not recorded with efficacy, p value=0.01, showing a significant difference.

Conclusion: We concluded that on comparison of efficacy of prophylactic low dose ketamine with tramadol for prevention of shivering during spinal anaesthesia in cases undergoing lower abdominal surgeries, Ketamine is found to be significantly more effective than Tramadol.

Keywords: Lower abdominal surgeries, spinal anaesthesia, prophylactic low dose ketamine, tramadol

INTRODUCTION

Preoperative shivering is a commonest problem during spinal anaesthesia and it occurs in 33% approximately. Spinal anaesthesia causes vasodilatation because of sympathetic blockade and leads for redistribution of heat. It also modifies the thermoregulatory system into hypothalamus and consumption up to 100 percent. It causes arterial hypoxia and correlates with increased risk of myocardial ischemia and also interferes with Echocardiography and pulse oximetry.

Usually, shivering and perioperative hypothermia is prevented by physical method like surface warming² and pharmacologically by drugs including pethidine³, fentanyl⁴, clonidine⁵, alfentanil⁶ and ondansetron⁷ etc. Various opioids and non-opioids are used for shivering. Tramadol, a synthetic opioid helps in preventing shivering by inhibitory reuptake of Serotonin and noradrenaline, and also proved to be as effective as a prophylaxis of shivering⁸. Ketamine being a competitive NMDA receptor antagonist is an effective agent in shivering prophylaxis⁹.

In our routine practice tramadol is usually used for controlling of shivering but there is no awareness of using Ketamine as a prophylaxis of shivering. We planned to study the effect of two drugs. The results will be shared with health professional and recommended in future use for patients.

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In a study conducted by Srikanta G¹⁰, Krishna G, has studied the effect of low dose ketamine, tramadol and pethidine on patients undergoing spinal anaesthesia for controlling perioperative shivering and concluded that shivering was 13% in ketamine group, 40% in tramadol group showing superiority of low dose ketamine with p<0.05 for control of perioperative shivering.

METHODOLOGY

In this randomized trial control, a total of 64 cases in two groups were enrolled in the study. The study was conducted in the Department of Anaesthesia and Intensive Care, CMH Lahore from January 2015 to June 2015.

We enrolled cases with ASA physical status class I-II between 18-50 years, of either sex, scheduled at CMH Lahore, undergoing elective lower abdominal procedures in supine position (general surgical procedures including hernioplasty, appendectomy, cystolithotomy) and obstetrical/gynaecological procedures i.e., abdominal and vaginal hysterectomy while unwilling patients, pregnant patient, procedures requiring transfusion of blood or blood product, Obese patients (BMI>30), patients with coagulopathy (Platelets count<80,000), abscess at the site of injection, Haemodynamically unstable patients (BP<100mmHg), Allergy to local anaesthetics were excluded from the study.

A total of 64 patients of either sex, meeting the inclusion criteria, enrolled from outpatients

department were randomly assigned into 2 groups: (computer –generated randomized list), i.e. group K and group T. All the preloading fluid was pre-warmed at 37 degrees Celsius. All the patients preloaded with 500 ml of Inj. Haes Steril 6% IV before employing spinal anaesthesia. With all aseptic precaution SAB was performed at L3 & L4 interspace using 27 G pencil point needle and 3 ml of 0.5% heavy Bupivacaine was injected intrathecally. Temperature of operating room was maintained at 24-26°C. After injecting the local anaesthetic, position was maintained and level of sensory block and degree of motor block was assessed. Tympanic membrane temperature was recorded. Then the patients in group K received Inj. Ketamine 0.05 mg/kg IV and patients in group T received Inj. Tramadol 1mg/kg IV. Grade of shivering was noted down intra-operatively and up to 30 minutes after the surgery, at 15 minutes interval, using Crossley and Mahajan scale¹¹ and recorded on the proforma.

RESULTS

Mean age in our study was calculated as 28.13±6.19 years. Comparison of efficacy in both groups was recorded which shows that 6(18.75%) in Group-K and 15(46.88%) in Group-T, p value was calculated as 0.01, which shows a significant difference between the two groups.

Table 1: Comparison of Efficacy in Both Groups (n=64)

Efficacy	Group K	Group T
Yes	6(18.75%)	15(46.88%)
No	26(81.25%)	17(53.12%)
Total	32(100%)	32(100%)

P value=0.01

DISCUSSION

In this study we compared the efficacy of prophylactic low dose ketamine and tramadol for prevention of shivering during spinal anaesthesia in cases undergoing lower abdominal surgeries so that the effect of two drugs may be found for effective control of shivering, the results may be shared with health professional at local level and recommended in future use for patients.

In this study, mean age of the patients was calculated as 28.13±6.19 years. Comparison of efficacy in both groups was recorded which shows that 18.75%(n=6) in Group-K and 46.88%(n=15) in Group-T, (p value0.01).

Our results are comparable with a study conducted by Srikanta G,¹⁰ Krishna G, revealed that the effect of low dose ketamine, tramadol and pethidine in patients undergoing spinal anaesthesia to control perioperative shivering and concluded that

shivering is 13% in ketamine group while 40% in tramadol group recorded with superiority of low dose ketamine with p<0.05 for control of perioperative shivering.

Norouzi et al¹¹ reported that ketamine 0.25mg kg⁻¹ and 0.5 mg kg⁻¹ was a good prophylactic drug for prevention of post-anesthetic shivering, Shakya et al¹² concluded that low dose ketamine 0.25mg·kg⁻¹ compared with ondansetron 4 mg dose was much effective in prevention of shivering in lower abdominal surgery under spinal anesthesia, Dal et al¹³ found that ketamine 0.5mg kg⁻¹ iv was effective as pethidine 20 mg in prevention of the postoperative shivering after induction of general anesthesia and Kose et al¹⁴ found that iv ketamine 0.5 and 0.75mg kg⁻¹ iv ketamine was effective as meperidine 25mg for the management of postoperative shivering. Ketamine prevents shivering by non-shivering thermogenesis at the level of the hypothalamus or the β adrenergic action of nor epinephrine¹⁵.

However, in light of the above discussion it is justified that “*Prophylactic intravenous administration of low dose ketamine (0.5mg/kg) reduces the perioperative shivering more as compared to tramadol (1mg/kg) during spinal anaesthesia*” is justified while comparing our results with other studies mentioned above.

Very few studies are available in relation to use of ketamine for preventing the shivering during general or regional anaesthesia probable because of its undesirable side effects e.g. too much sedation, hallucination and nausea and vomiting.

In conclusion, the prophylactic administration of low dose ketamine (0.25mg kg⁻¹) and Tramadol (1mg/kg) during spinal anaesthesia were comparable in reducing the incidence of shivering and both had significant anti-shivering effect compared, but ketamine group was significantly more effective than Tramadol.

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