ejpmr, 2022,9(5), 17-20

SJIF Impact Factor 6.222

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Research Article

ISSN 2394-3211

EJPMR

THE EFFECTIVENESS OF TRAMADOL AND PETHIDINE FOR THE MANAGEMENT OF SHIVERING DURING SPINAL ANAESTHESIA IN CESAREAN DELIVERY AND OTHER SURGERY

Md. Shah Alamgir[1]*, Jahir Uddin Ahmed[2], Ruma Akter[3], Mehtab Uddin Ahmed[4] and Tanzila Islam[5]

[1]Senior Consultant, Dept. of Anesthesia, 250 Bedded General Hospital, Manikganj.
[2]Senior Consultant, Department of Anesthesia, 300 Bedded Hospital, Narayanganj.
[3]Senior Consultant, Dept. of Gyanee and Obs, 250 Bedded General Hospital, Manikganj.
[4]Assistant Professor, Dept. of Surgery, Colonel Malek Medical College and Hospital, Manikganj.
[5]Assistant Professor, Dept. of Radiology and Imaging, Colonel Malek Medical College and Hospital, Manikganj.

***Corresponding Author: Dr. Md. Shah Alamgir**

Senior Consultant, Dept. of Anesthesia, 250 Bedded General Hospital, Manikganj.

Article Received on 11/03/2022 **Article Revised on 01/04/2022** **Article Accepted on 21/04/2022**

ABSTRACT

Background: *Spinal anaesthesia (or spinal anesthesia), also called spinal block, subarachnoid block, intradural block and intrathecal block, is a form of neuraxial regional anaesthesia involving the injection of a local anaesthetic or opioid into the subarachnoid space. It is a safe and effective form of anesthesia usually performed by anesthesiologists that can be used as an alternative to general anesthesia commonly in surgeries involving the lower extremities and surgeries below the umbilicus.* ***Objective:*** *The purpose of this prospective randomized clinical trial was to assess the effectiveness, potency, and adverse effects of tramadol and pethidine for the management of shivering during spinal anaesthesia in cesarean delivery and other surgery.* ***Method:*** *This prospective study was done at Manikganj 250 Bedded General Hospital, Manikganj where after approval from departmental review board and obtaining patient's written informed consent, 50 ASA grade I and II parturients, who subsequently developed shivering during elective or emergency cesarean section under spinal anaesthesia were included in the study. Besides that 50 other patients who developed fissure, hernia, fistula, scrotal abscess and undergo appendicectomy were also induced in the study. Patients who developed either grade 3 or grade 4 shivering were divided into two groups, Group 1 and Group 2. Group 1 (n=50) received inj tramadol 0.5 mg/kg body weight and Group 2 (n=50) received inj pethidine 0.5 mg/kg body weight for treatment of shivering after delivery of the baby.* ***Results:*** *During the study, Onset of shivering and severity of shivering (shivering grade) were almost similar in both groups and differences were statistically not significant. Shivering disappeared in 99% patients who received tramadol and 97% patients who received pethidine. Regarding responsiveness to treatment between two groups was almost similar and differences were not significant. Both the drugs were found to be effective in treatment of shivering. Severity of shivering was unchanged in 1% patient in Group 1 and 3% patients in Group 2. Recurrence of shivering occurred 3% patients in Group 1 and 12.50% patients in Group 2 and the difference between two groups was statistically significant (P<0.01). Moreover, side effects were significantly higher in Group 2 than Group 1. Nausea in 9% patients and vomiting in 11% patients were found in Group 2 and nausea in 2% patient and vomiting in 3% patient were found in Group T. Differences were statistically significant in case of nausea (P<0.05) and vomiting (P<0.05). Pruritus were observed in no patient of Group 1 and in Group 2 pruritus was observed in 7% patients. Differences were statistically highly significant in case of pruritus (P<0.001).* ***Conclusion:*** *Though both tramadol (0.5mg/kg bodyweight) and pethidine(0.5mg/kg bodyweight) effectively control shivering in parturient during spinal anaesthesia. But tramadol offered rapid onset, less recurrence rate and less side effects like nausea, vomiting, dizziness and pruritus when compared to pethidine.*

KEYWORDS*: Spinal Anesthesia, Shivering, Cesarean section, Other surgery.*

INTRODUCTION

Spinal anaesthesia is frequently used as a safe anaesthetic technique for both elective and emergency cesarean sections. Shivering is one of the most common complications of spinal anaesthesia, affecting 40–70% of patients.[1-2] Shivering may be uncomfortable and physiologically distressing for sufferers. Mild shivering raises oxygen consumption to levels comparable to light exercise, but severe shivering raises metabolic rate and oxygen consumption by 100-600%, as well as carbon dioxide generation.

Shivering can be controlled using a variety of techniques during regional anaesthesia. Pharmacological therapies, such as pethidine, clonidine, tramadol, doxapram, nefopam, and others, have been tested since they are easy, cost effective, and widely available.[3-4] However, the relative effectiveness of these drugs is unknown. Tramadol has been used as an analgesic for labor pain without adverse effects on the mother or newborn, and it is also useful in the treatment of postoperative shivering.[6]

In terms of analgesia, tramadol and pethidine are roughly equivalent. The anti-shivering actions of these two drugs, however, may be mediated by distinct receptors. The purpose of this prospective randomized clinical trial was to assess the effectiveness, potency, and adverse effects of tramadol and pethidine for the management of shivering during spinal anaesthesia in cesarean delivery and other surgery.

OBJECTIVE

To assess the effectiveness of tramadol and pethidine for the management of shivering during spinal anaesthesia in cesarean delivery and other surgery.

METHODOLOGY

This prospective study was done at Manikganj 250 Bedded General Hospital, Manikganj. This study was conducted from June 2020 to December 2020. After approval from departmental review board and obtaining patient's written informed consent, 50 ASA grade I and II parturient, who subsequently developed shivering during elective or emergency cesarean section under spinal anaesthesia were included in the study. Besides that 50 other patients who developed fissure, hernia, fistula, scrotal abscess and undergo appendicectomy were also induced in the study.

Patients with known hypersensitivity to tramadol or pethidine, known history of substance abuse, hyperthyroidism, cardiovascular diseases, psychological disorders or who received intramuscular pethidine for labour pain within one hour were excluded from the study. Patients who developed either grade 3 or grade 4 shivering were divided into two groups, Group 1 and Group 2. Group 1 (n=50) recieved inj tramadol 0.5 mg/kg body weight and Group 2 (n=50) received inj pethidine 0.5 mg/kg body weight for treatment of shivering after delivery of the baby.

RESULTS

In table-1 shows age distribution of the study group where majority were belonging to 26-33 years age group, 65%. Followed by 25% belong to 18-25 years group and 10% belong to 34-39 years age group. The following table is given below in detail:

Table 1: Age distribution of the patients.

Age group	%
18-25 years	25%
26-33 years	65%
34-39 years	10%

In figure-1 shows distribution of the patients according to conditions where Cesarean section was 50%. Followed by appendicectomy 20%, anal fissure 10%.hernia 10%, fistula in 5%.scrotal abscess 5%. The following figure is given below in detail:

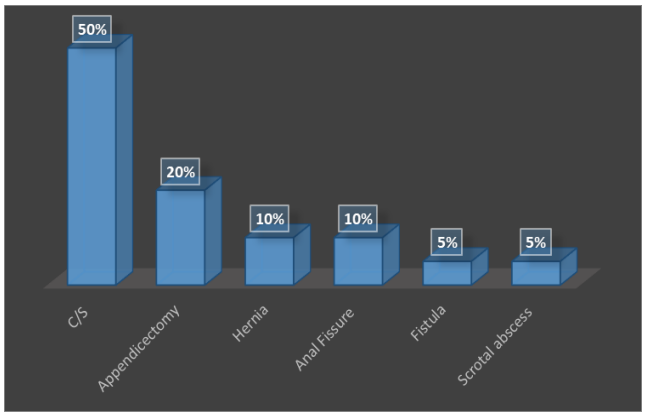

Figure 1: Distribution of the patients according to conditions.

In table-2 shows preoperative status of the study group where in group-1 amount of Intravenous Infusion was 1930.86±195.12 ml followed by Axillary Temperature was 36.0±0.51 Celsius and mean duration of surgery was 49.60±7.02 min. Whereas in group-2 amount of Intravenous Infusion was 1890±200.67 ml followed by Axillary Temperature was 39.0±0.65 Celsius and mean duration of surgery was 45.89±7.30 min. The following table is given below in detail:

Table 2: Preoperative status of the study group.

	Group-1	Group-2
ASA Physical Status I II	 80% 20%	 90% 10%
Amount of Intravenous Infusion(ml)	1930.86±195.12	1890±200.67
Axillary Temperature (Celsius)	36.0 ±0.51	39±0.65
Duration of Surgery (minute)	49.60±7.02	45.89±7.30

In table-3 shows outcome of surgery where Onset of shivering and severity of shivering (shivering grade) were almost similar in both groups and differences were statistically not significant. Shivering disappeared in 99% patients who received tramadol and 97% patients who received pethidine. Regarding responsiveness to treatment between two groups was almost similar and differences were not significant. Both the drugs were found to be effective in treatment of shivering. Severity of shivering was unchanged in 1% patient in Group 1 and 3% patients in Group 2. Recurrence of shivering occurred 3% patients in Group 1 and 12.50% patients in Group 2 and the difference between two groups was statistically significant (P<0.01). The following table is given below in detail:

Table 3: Outcome of surgery.

	Group-1	Group-2
Onset of Shivering (minute)	15.75±3.63	16.89±4.02
Severity of Shivering (Grade)	3.1±0.8	3.10±1.1
Response Rate	99%	97%
Unresponsive	1%	3%
Time Interval from Treatment to Cessation of Shivering(minute)	2.96±0.86	5.00±1.02
Recurrence of Shivering	3%	12.50%

In figure-2 shows side effects of treatments where side effects were significantly higher in Group 2 than Group 1. Nausea in 9% patients and vomiting in 11% patients were found in Group 2 and nausea in 2% patient and vomiting in 3% patient were found in Group T. Differences were statistically significant in case of nausea (P<0.05) and vomiting (P<0.05). Pruritus were observed in no patient of Group 1 and in Group 2 pruritus was observed in 7% patients. Differences were statistically highly significant in case of pruritus (P<0.001). The following figure is given below in detail:

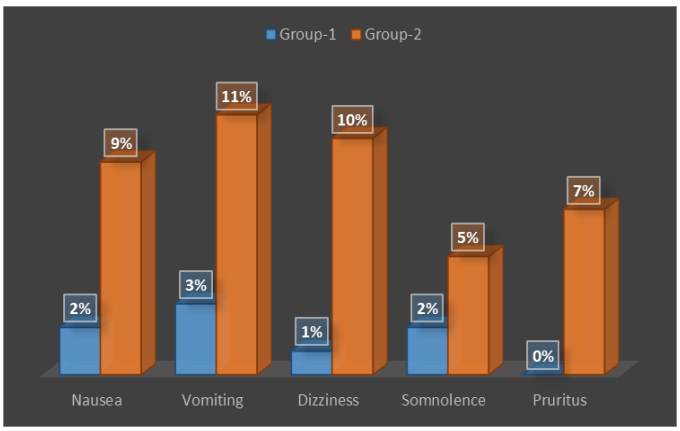

Figure 2: Side effects of treatment.

DISCUSSION

In this study we have compared recently introduced synthetic opioid tramadol with pethidine, which used traditionally for control of shivering. Tramadol's opioid action preferably mediated via mu receptor with minimal effect on kappa and delta binding sites.

Tramadol has a modulatory effect on central mono-aminergic pathways; this inhibits the reuptake of noradrenalin/serotonin and encourages hydroxytryptamine secretion which resets the body temperature regulation centre. The anti shivering action of tramadol is probably via its opioid or serotonergic and noradrenergic activity or both.[6-10]

Pethidine controlled shivering most likely mediated via receptors other than mu receptor in particular the kappa receptor. This is supported by observations that pethidine controlled shivering better than morphine and fentanyl.[11-12] Therefore we undertook a study to compare a newer agent tramadol with time tested drug pethidine. In this study, we observed tramadol is as effective as pethidine in treating post spinal anaesthesia shivering. The response rate of treatment of shivering found satisfactory with both tramadol and pethidine and was almost similar. But the time interval from commencement of treatment to cessation of shivering was quite less with tramadol (2.96±0.86 min) than with pethidine (5.00±1.02 minutes) and difference was statistically significant (P<0.01). About recurrence of shivering, it was more with pethidine; 3% patients with tramadol had recurrence while 12.5% suffered recurrence with pethidine and difference was statistically significant (P<0.01). Earlier studies supported less recurrence with tramadol, which noted 8% recurrence with tramadol and 15% with pethidine.[6,9]

Our results are in accordance with the study on higher efficacy of tramadol in controlling the postoperative shivering. Where it was found that shivering disappeared in 1 minute with tramadol 1mg/kg bodyweight and in 5 minutes with pethidine 1mg/kg bodyweight. In another study efficacy and harm of tramadol for treatment of post spinal anaesthesia shivering in cesarean section were evaluated. They compared tramadol (0.5mg/kg bodyweight) with pethidine (0.5mg/kg bodyweight) to control of shivering and concluded tramadol was more effective to control of shivering but results in more nausea, vomiting.[12]

Side effects were significantly higher in Group 2 than Group 1. Nausea in 9% patients and vomiting in 11% patients were found in Group 2 and nausea in 2% patient and vomiting in 3% patient were found in Group 1. Differences were statistically significant in case of nausea (P<0.05) and vomiting (P<0.05). Pruritus were observed in no patient of Group 1 and in Group 2 pruritus was observed in 7% patients. Differences were statistically highly significant in case of pruritus (P<0.001). Whereas one study showed pethidine was associated with more nausea, vomiting and sedation than tramadol in control of post operative shivering. Study reported higher incidences of vomiting with tramadol than pethidine, while another showed a higher incidences of vomiting with buterophanol compared to tramadol.[13]

CONCLUSION

Though both tramadol (0.5mg/kg bodyweight) and pethidine(0.5mg/kg bodyweight) effectively control shivering in parturient during spinal anaesthesia. But tramadol offered rapid onset, less recurrence rate and less side effects like nausea, vomiting, dizziness and pruritus when compared to pethidine.

REFERENCE

1. De Whitte, Sessler DI. Perioperative shivering: Physiology and pharmacology. Anaesthesiolgy, 2002; 96: 467-84.
2. Sessler DI, Ponte J. Shivering during epidural anaesthesia. Anaesthesiology, 1990; 72: 816-21.
3. Bhatnagor S, Saxena A, Kannan TR, Punj J, Panigrahi M, Mishra S. Tramadol for postoperative shivering: A double blind comparison with pethidine. Anaesth Intensive Care, 2001; 29: 149-54.
4. Katyal S, Tewari A. Shivering: Anaesthetic considerations. J Anaesth Clin Pharmacol, 2002; 18: 363-76.
5. Sessler DI. Temperature monitoring. In: Miller RD, 5th ed. Textbook of Anaesthesia. Churchill Livingstone Inc, New York, 1994; 1367-89.
6. Mathews S, Al Mulla A et al. Postanaesthetic shivering – A new look at tramadol. Anaesthesia, 2002; 57: 387-403.
7. Anne Miu, Han Chan, Kwok Fu et al. Control of shivering under regional anaesthesia in bstetric patients with tramadol. Can J Anesth, 1999; 46(): 253-8.
8. Wrench IJ, Cavill G, Ward JE, Crossly AW. Comparison between alfentanil, pethidine and lacebo in the treatment of post operative shivering. Br J Anaesth, 1997; 79: 541-2.
9. Ikeda T, Sesslar DI, Tayefeh F, et al. Meperidine and alfentanyl do not reduce the gain or maximum intensity of shivering. Anaesthesiology, 1998; 88: 858-65.
10. Bhattcharya PK, Bhattcharya L, Jain RK, Agarwal RC. Post anaesthesia shivering (PAS): A Review. Indian J Anaesth, 2003; 47(2): 88-93.
11. Viegas OA, Khow B, Ratnam SS. Tramadol in labour in primiparous patients: A prospective comparative clinical trial. Eur J Obstet Gynecol Repord Biol, 1993; 49(1): 131-5.
12. Pausawasdi S, Jirasiritham S, Phaoaric C. The use of tramadol hydrochloride in the treatment of post anasesthetic shivering. J Med Assoc Thai, 1990; 73(1): 16-20.
13. Wrench IJ, Singh P, Dennis AR, Mahajan RP, Crossly AW. The minimum effective doses of pethidine and doxapram in the treatment of post anaesthetic shivering. Anaesthesia, 1977; 52: 32-6.