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Original Research Article

COMPARISION OF NALBUPHINE VERSUS KETAMINE FOR TREATING POST ANAESTHTIC SHIVERING AFTER SPINAL ANAESTHESIA IN PATIENTS UNDERGOING INFRA UMBILICAL SURGERIES

[1]Dr Sohail Shali, [2]Dr Rahul Fernandez, [3]Dr Lavanya Pawar, [4]Dr Gayatri CK

[1]Specialist Intensivist, Gulbarga Institute of Medical Sciences, Kalaburagi
[2]Consultant Rainbow Hospitals, Department of Anesthesiology, Bangalore
[3]Assistant Professor, Department of Pharmacology, ESICMC, Kalaburagi
[4]Assistant Professor, Department of Anesthesiology, ESICMC, Kalaburagi
Corresponding Author: Dr Gayatri CK

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Abstract
Shivering is known to be a frequent complication, reported in 40 to 70 % of patients undergoing surgery under regional anesthesia. Post-anesthetic shivering is spontaneous involuntary , rhythmic , oscillating, tremor-like muscle hyperactivity that increases metabolic heat production up to 600% after general or regional anesthesia .Post anesthetic shivering may cause discomfort to patients, and aggravate wound pain by stretching incisions and increase intracranial and intraocular pressure. Various methods are available for control of shivering; these may be non pharmacological or pharmacological methods using drugs which have anti-shivering properties.
Keywords: Nalbuphine, Ketamine, Infra Umbilical Surgeries

INTRODUCTION

Shivering is known to be a frequent complication, reported in 40 to 70 % of patients undergoing surgery under regional anesthesia.(1,2)Post-anesthetic shivering is spontaneous involuntary , rhythmic , oscillating, tremor-like muscle hyperactivity that increases metabolic heat production up to 600% after general or regional anesthesia .(3) Post anesthetic shivering may cause discomfort to patients, and aggravate wound pain by stretching incisions and increase intracranial (4) and intraocular (5) pressure. Various methods are available for control of shivering; these may be non pharmacological or pharmacological methods using drugs which have anti-shivering properties.

Nalbuphine, a semisynthetic opioid related to both naloxone and oxymorphone, has the characteristics of μ-antagonist and κ-agonist activities. It has a high affinity for κ-opioid receptors in the central nervous system. Therefore, nalbuphine got a significant effect on post spinal anesthesia shivering. But nalbuphine associated with many side effects like respiratory depression, urinary retention, nausea, vomiting, sedation and pruritus(6-9)
Ketamine has also been used as an anti-shivering drug. It is a non-competitive N-methy-D-aspartate (NMDA) receptor antagonist. Ketamine increases arterial pressure, heart rate, and cardiac output because of direct central sympathetic stimulation and inhibition of norepinephrine uptake into postganglionic sympathetic nerve endings, and may decrease core-to-peripheral redistribution of heat(10). Thus helps in prevention of shivering.
It is used as antishivering agent in dose of 0.5-0.75mg kg-1 IV. But even in these doses it causes side effects i.e. drowsiness, hallucination and delirium.(11-14)

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So we conducted the present study to evaluate and compare the relative efficacy and safety of low dose ketamine (0.25 mg/kg) and nalbuphine (0.1mg/kg) for prevention of shivering in ASA 1 and 2 patients during spinal anaesthesia.

2)MATERIALS AND METHODS:

a) Study Site

Patients undergoing infra umbilical surgeries under sub arachanoid block(SAB) at ESIC medical college & post graduate institute of medical sciences & research, Gulbarga.

b) Study Duration

The study will be done between April 2022 to September 2022

e) Inclusion criteria

1) Patients belonging to ASA Grade I and Grade II(Annexure II).
2) Scheduled for infra umbilical surgeries.

f) Exclusion criteria:

1) Patient not willing to take part in the study
2) Cardiovascular instability like pre eclampsia, essential hypertension
2) History of respiratory disorders
3) Bleeding disorders or patient on anticoagulant therapy
4) Known allergy to local anaesthetic agents

Results

	GROUP K	GROUP N
AGE	38.87±15.15	37.03±13.29
HEIGHT	163.70±6.72	162.40±7.33
WEIGHT	65.47±5.31	65.07±5.37
DURATION OF SURGERY	46.33±12.36	47.24±11.24

Demographic parameters were comparable

Heart Rate

Heart Rate (bpm)	Group K	Group N	P value
Basal	94.83±11.31	95.26±11.28	0.874
5min	91.11±10.53	91.60±10.28	0.846
10 min	89.29±10.19	89.89±10.02	0.805
15 min	88.66±8.08	89.23±7.94	0.766
20 min	87.00±7.51	88.03±7.55	0.570
25 min	85.66±7.44	86.71±7.82	0.564
30 min	83.49±8.35	84.83±8.49	0.507
40 min	82.94±9.17	83.66±9.24	0.746

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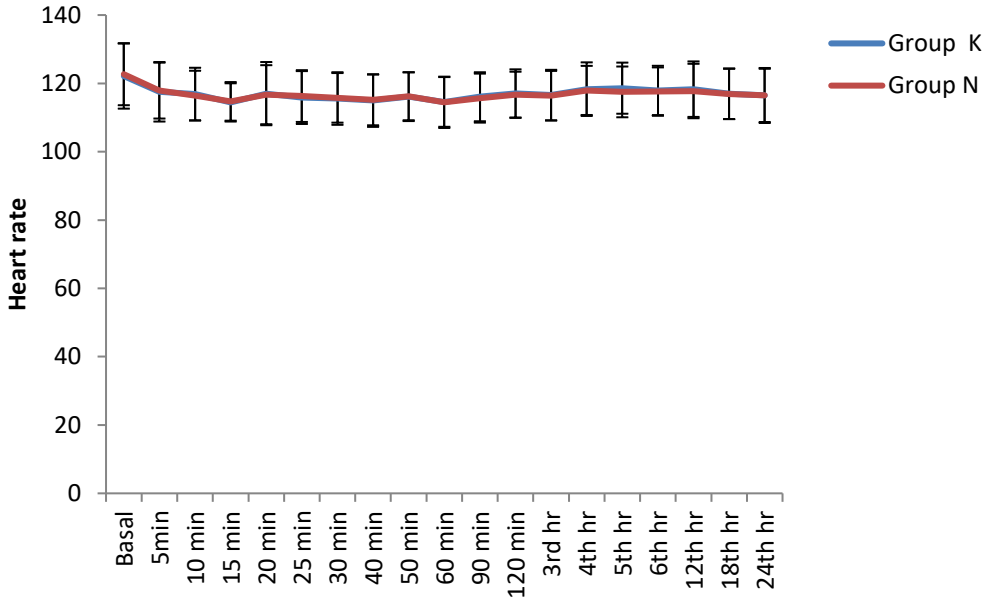
50 min	82.31±8.49	81.94±8.92	0.859
60 min	82.69±8.65	82.40±8.77	0.891
90 min	82.03±8.57	81.86±8.84	0.935
120 min	82.26±8.43	81.91±8.97	0.870
3rd hr	82.71±7.85	82.49±7.97	0.904
4th hr	83.71±7.31	83.80±7.06	0.960
5th hr	83.63±6.24	83.46±6.09	0.908
6th hr	82.97±7.08	82.77±6.92	0.905
12th hr	83.66±7.07	84.17±6.71	0.756
18th hr	82.83±7.97	83.66±7.53	0.656
24th hr	83.34±7.85	84.43±7.39	0.553



In both the groups there was no incidence of bradycardia

Mean Arterial Pressure

MAP (mm Hg)	Group K	Group N	P value
Basal	88.03±8.30	88.66±7.48	0.740
5min	85.51±10.44	86.29±9.21	0.744
10 min	83.03±9.93	82.80±8.71	0.919
15 min	82.31±10.48	82.46±9.20	0.952
20 min	80.46±10.87	81.00±9.42	0.824
25 min	79.66±9.31	80.34±8.77	0.752

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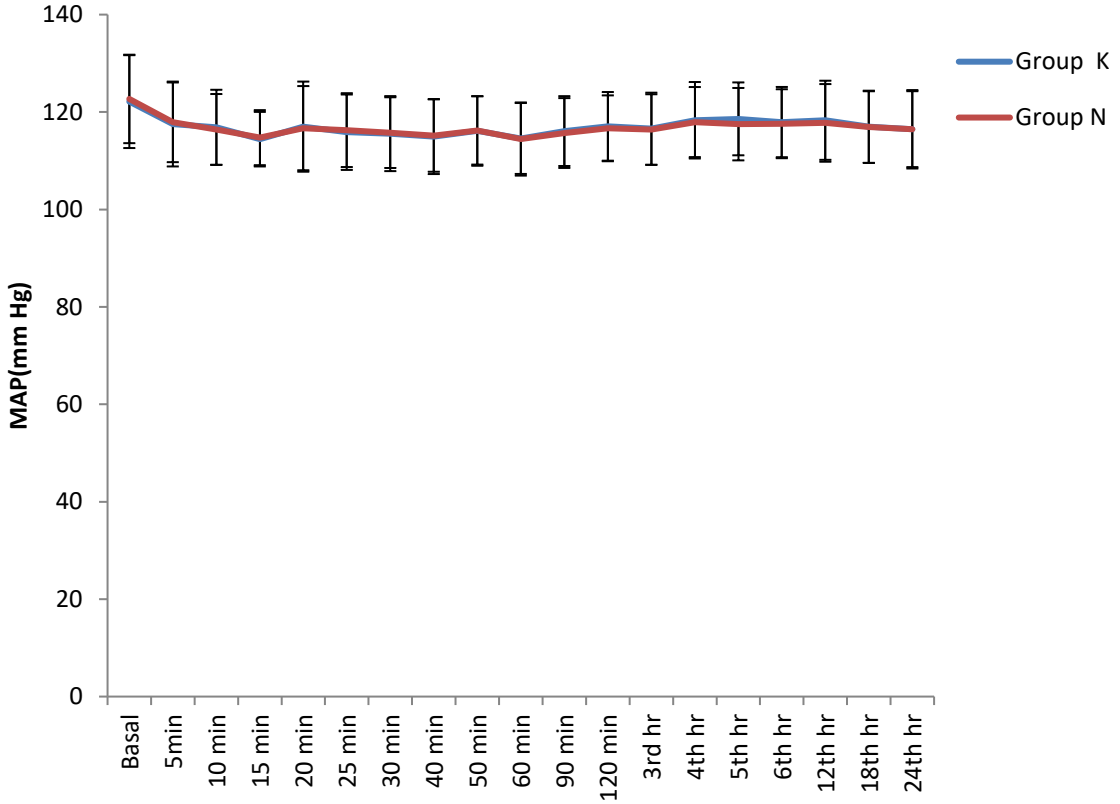
30 min	79.63±7.99	79.77±7.60	0.939
40 min	79.34±7.77	79.80±7.46	0.803
50 min	81.31±8.16	81.71±7.92	0.836
60 min	79.46±7.64	79.91±7.37	0.800
90 min	80.37±7.14	80.31±6.91	0.973
120 min	81.14±8.65	81.11±7.79	0.988
3rd hr	81.11±7.93	81.54±7.52	0.817
4th hr	81.40±7.23	81.34±6.61	0.973
5th hr	82.74±7.40	83.00±6.89	0.881
6th hr	82.69±8.46	83.34±7.86	0.737
12th hr	82.43±9.42	83.2±8.56	0.721
18th hr	81.69±9.06	82.74±8.09	0.608
24th hr	81.03±7.98	81.60±7.17	0.754



There was no incidence of hypotension in both the groups.

Incidence of shivering

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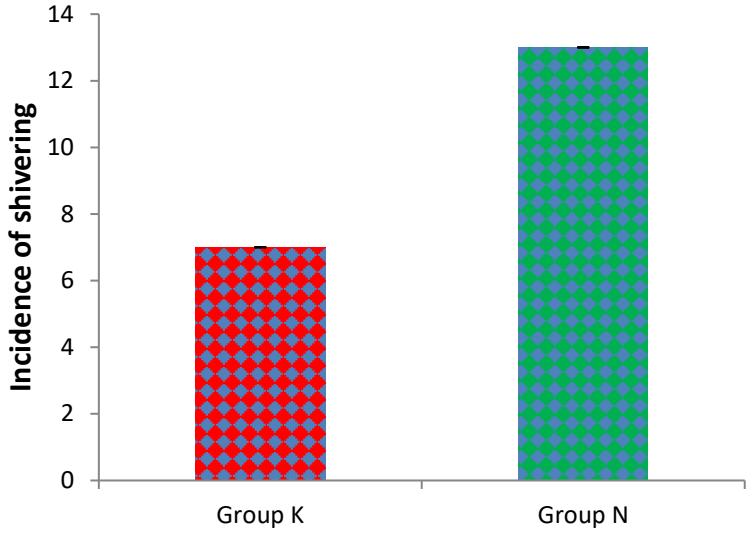
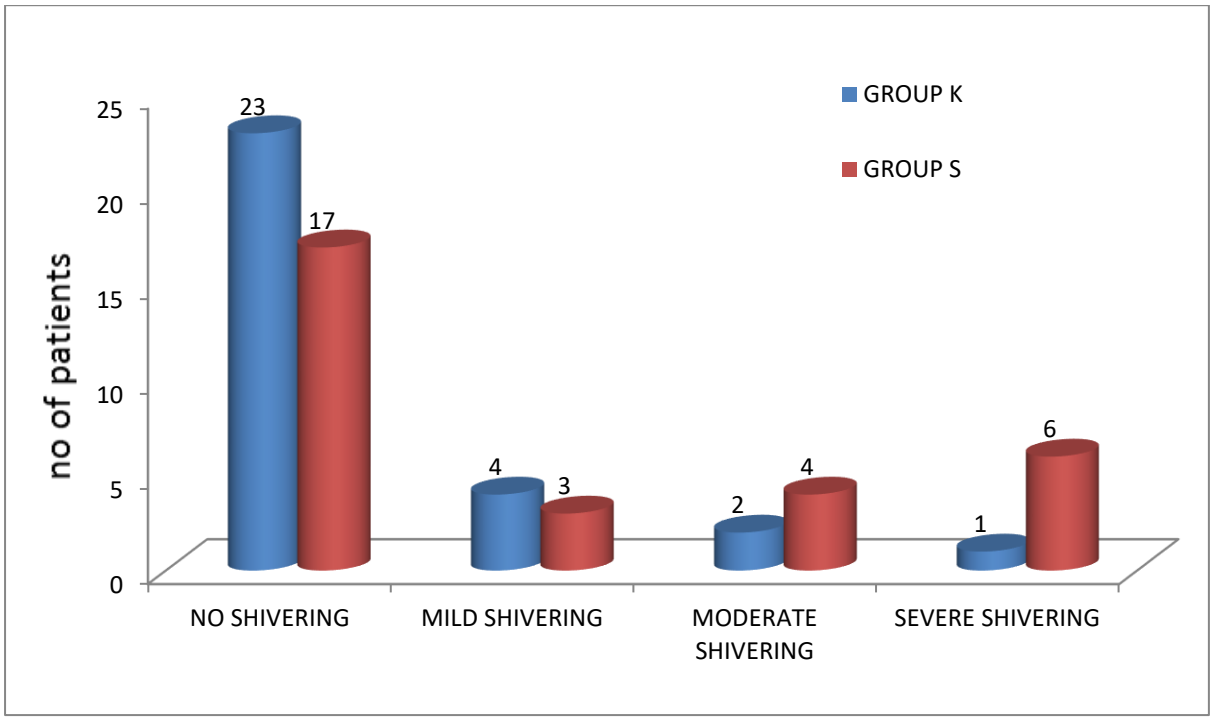


	Group K	Group N	P value
Incidence of shivering	7(23.3%)	13(43.3%)	<0.001**

Incidence of shivering was more in Nalbuphine s group compared to ketamine group.

Comparison of Severity of Shivering between the Ketamine Group(K) and Nalbuphine Group(N).



Shivering severity grade was more in Nalbuphine group compared to Ketamine group .

DISCUSSION

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Ketamine, which is a competitive receptor antagonist of N-methyl-D-aspartic acid (NMDA), has a role in thermoregulation at various levels[(9)].Ketamine controls shivering by nonshivering thermogenesis either by action on the hypothalamus or by the b-adrenergic effect of norepinephrine. Ketamine causes sympathetic stimulation and vasoconstriction in patients at risk of hypothermia.Even at sub-anaesthetic doses, ketamine might cause a dissociative state, characterised by a sense of detachment from one's physical body and the external world (depersonalization and derealization).[10]Aim of our study was to use low dose of ketamine for prevention of shivering.
Honarmand et al, in 2008 used 2 different doses of ketamine i.e. 0.5mg/kg and 0.25mg/kg for prevention of shivering during regional anaesthesia and concluded that dose of 0.25mg/kg was more effective in preventing shivering with less adverse events.[11]

In a research article done by Yang Zhou et at in the year 2019, based on the various studies database they concluded that prophylactic use of ketamine is very effective in preventing shivering but dose of 0.5mg/kg or more is assosciated with hallucinogenic effect.
In our study we have used ketamine in the dose of 0.25mg/kg and we didn't observe any adverse event.[12-13]

CONCLUSION

Ketamine in the low dose is effective in preventing the post spinal shivering in patients undergoing infraumbilical surgeries under spinal anaesthesia without any side effects.
magnitude of redistribution hypothermia. Anesth Analg 2001; 93: 934 – 8

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