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COMPARISON OF PROPHYLACTIC INTRAVENOUS MAGNESIUM VERSUS KETAMINE ON SUCCINYLCHOLINE-INDUCED FASCICULATIONS AND POSTOPERATIVE MYALGIA IN PATIENTS UNDERGOING ELECTIVE SURGERY UNDER GENERAL ANESTHESIA

Anaesthesiology

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ABSTRACT

Aim And Objectives : *To evaluate the effect and compare intravenous magnesium sulphate and ketamine on succinylcholine induced fasciculations and postoperative myalgia in patients undergoing elective surgery under general anesthesia.* ***Materials And Method****:30 patients were allocated to each group and study drugs was injected intravenously as per group allotment.Group A - 40mg/kg magnesium sulphate in 100 ml NS, infused in 10 minutes just prior to anesthesia induction.Group B - 0.5mg/kg ketamine diluted in 100 ml NS over 10 minutes just prior to anesthesia induction. Anesthesia was induced with Fentanyl (2mcg/kg), propofol (2mg/kg) and succinyl choline (1.5mg/kg) and maintained with O2, N2O, isoflurane and vecuronium.Demographic profile, hemodynamics and Succinyl choline induced fasciculations and post-operative myalgia (24 hrs) grading shall be noted as no fasciculations and no myalgia as 0 and 1, 2, 3 as mild, moderate, severe.* ***Results:*** *In magnesium group 15/30 patients exhibited fasciculations (Mild: 8/30; moderate: 7/30) while in ketamine group all the patients exhibited fasciculation (Mild: 7/30, moderate: 20/30, severe 3/30) (p<0.0001).None of the patients of magnesium group experienced postoperative myalgia while 10 patients experienced post-operative myalgia in ketamine group (p=0.002), there are no significant change in hemodynamics after study drugs and intubation, significant change was seen in hemodynamics in first 30 minutes of surgery .* ***Conclusion****: Both groups have been mentioned in medical literature to prevent post-operative myalgia. However, Magnesium has been found more effective in prevention of succinyl choline induced fasciculations and myalgia.*

KEYWORDS

Ketamine, succinylcholine

INTRODUCTION

Succinylcholine is considered to provide ideal intubating conditions, anticipated difficult airways and rapid sequence induction and intubation due to its fast onset of action. Succinylcholine is two molecules of acetylcholine combined back to back.It combines with nicotinic receptor and unlike acetylcholine,produce persistent depolarisation resulting in muscle paralysis.Since this depolarisation is not coordinated contraction.It produces fasciculations.

However, in addition to a number of infrequent, but well known, untoward effects like fasciculations and postoperative myalgia its usefulness is limited.

Magnesium sulfate is described as physiological antagonist of calcium, It is the second most abundant intracellular ion and is a cofactor of many enzymatic reactions.It depresses myocardium and vascular smooth muscle directly.

ketamine inhibits the NMDA receptors which have been activated by glutamate, an excitatory neurotransmitter. It also inhibits serotonin and muscarinic receptors. It is an agonist of mu type of opioid receptors.

Background: Magnesium sulfate and ketamine have been found to be effective against succinylcholine-induced fasciculations and myalgia, respectively, in separate studies. A prospective randomized double blind controlled study was designed to assess the effect of a combination of magnesium sulfate with ketamine for induction of anesthesia on succinylcholine-induced fasciculations and myalgia.

AIMS & OBJECTIVES

To evaluate the effect and compare intravenous magnesium sulphate and ketamine on succinylcholine- induced fasciculations and postoperative myalgia in patients undergoing elective surgery under general anesthesia.

MATERIALS & METHODS

30 patients were allocated to each group and study drugs was injected intravenously as per group allotment.

Group A-40mg/kg magnesium sulphate in 100 ml NS, infused in 10 minutes just prior to anesthesia induction.

Group B - 0.5mg/kg ketamine diluted in 100 ml NS over 10 minutes just prior to anesthesia induction.

- Anesthesia was induced with Fentanyl (2mcg/kg), propofol (2mg/kg) and succinyl choline (1.5mg/kg) and maintained with O2, N2O, isoflurane and vecuronium.
- Demographic profile, hemodynamics and Succinyl choline induced fasciculations and post-operative myalgia (24 hrs) grading shall be noted as no fasciculations and no myalgia as 0 and 1, 2, 3 as mild, moderate, severe.

Table No. 1

FASCICULATIONS		SCORE
No visible fasciculations	Nil	0
Very fine in fingertips,eyes,face,neck without movements of limbs	Mild	1
Obvious muscle twitching at more than one site or movement of limbs.	Moderate	2
Vigorous, sustained and widespread fasciculations	Severe	3

Table No. 2

MYALGIA		SCORE
Absense of pain	Nil	**0**
Muscle stiffness or pain on specific questioning in nape of neck,shoulder and lower chest on deep breathing	Mild	**1**
Muscle stiffness and pain complained by the patient spontaneousely, requesting analgesia	Moderate	**2**
Incapacitating generalized muscle stiffness or pain	Severe	**3**

RESULTS:

In magnesium group 15/30 patients exhibited fasciculations (Mild: 8/30; moderate: 7/30) while in ketamine group all the patients exhibited fasciculation (Mild: 7/30, moderate: 20/30, severe 3/30) (p<0.0001).

Table No.3

		Magnesium	Ketamine
Patient experienced fasciculations	Mild Moderate Severe	8/30 7/30 -	7/30 20/30 3/30
Patient experienced post op myalgia		0	10

None of the patients of magnesium group experienced postoperative myalgia while 10 patients experienced post-operative myalgia in

ketamine group (p=0.002).

Table No.4

Heart rate	Magnesium	Ketamine	P value
Baseline	81.63+/-10.41	79.18+/-13.98	0.378
After study drugs	78.8+/-10.97	80.6+/-15.31	0.547
After intubation	80.90+/-13.56	82.63+/-15.33	0.222
5 min	78.55+/-14.67	97.13+/-8.46	<0.001
10 min	76.88+/-13.37	97.38+/-18.64	<0.001
15 min	76.45+/-14.28	97.13+/-18.40	<0.001
30 min	76.03+/-14.7	95.65+/-18.72	<0.001
45 min	77.1+/-13.14	87.03+/-17.8	0.006
60 min	77.72+/-14.2	81.45+/-14.87	0.255

Table No. 5

MAP	Magnesium	Ketamine	p
Baseline	85.85+/-15.67	86.08+/-12.16	0.697
After study drugs	79.28+/-14.67	87.1+/-11.38	0.023
After intubation	73.8+/-13.57	90.38+/-14.94	<0.001
5 min	73.83+/-11.07	96.45+/-12.09	<0.001
10 min	74+/-11.52	90.75+/-13.08	<0.001
15 min	76.28+/-11.87	90.45+/-12.49	<0.001
30 min	75.18+/-11.6	89.13+/-13.76	<0.001
45 min	74.88+/-11.42	86.45+/-12.97	0.255
60 min	74.68+/-12.0	82.42+/-13.48	0.31

- There are no significant change in hemodynamics after study drugs and intubation
- Significant change was seen in hemodynamics in first 30 minutes of surgery

CONCLUSION:

Both groups have been mentioned in medical literature to prevent post-operative myalgia. However, Magnesium has been found more effective in prevention of succinyl choline induced fasciculations and myalgia

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