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MAGNESIUM SULPHATE (150 MG)AS AN ADJUVANT IN USG GUIDED SCB IS BETTER THAN POTASSIUM CHLORIDE (0.2MMOLES) FOR POST OPERATIVE ANALGESIA IN ADULT SURGICAL PATIENTS.

Anaesthesiology

Dr. Santosh Kumar Bhaskar Professor, Anaesthesiology,CMCH,Bhopal,

Dr. Shailendra Dawer Associate Professor, Anaesthesiology,CMCH,Bhopal - Corresponding Author

ABSTRACT

Aim : The study was undertaken to compare the efficacy of Magnesium sulphate with potassium chloride as an adjuvant for post operative analgesia in USG guided SCB.

Materials and methodology: The patients were randomly divided into 3 groups of 20 each into group A (KCl - 0.2 mmoles(1ml solution)), group B ($MgSO_4$-150mg (1ml solution)) and group C (Control-1 ml NS) added as adjuvant in USG guided SCB. Duration of effective analgesia and side effects, if any were noted.

Observation: The duration of effective analgesia was found to be 261.25 ± 46.84 minutes in Group B: Magnesium sulphate (150mg) followed by 216.15 ± 63.06 minutes in Group A: Potassium chloride (0.2mmoles) and lastly 180.25 ± 16.42 minutes in Group C: Control.

Conclusion: Magnesium sulphate (150 mg)as an adjuvant in USG guided SCB is better than potassium chloride (0.2mmoles) for post operative analgesia in adult surgical patients.

KEYWORDS:

USG guided SCB, postoperative analgesia, adjuvant, KCl, MgS04

INTRODUCTION:

The relief from pain is the essence of anaesthesia. Pain relief is necessary for humanitarian as well as therapeutic purposes. During post-operative period patient suffers both physically as well as psychologically.

The aim of postoperative pain relief is to provide subjective comfort in addition to inhibiting trauma induced nociceptive impulses to blunt autonomic and somatic reflex response to pain and subsequently enhance restoration of function by allowing patient to breathe, cough and to be ambulatory as early as possible, thereby preventing postoperative pulmonary complications and inhibiting sympathetic nervous stimulation, resulting in a sound and early recovery.

Ultrasound (USG)-guided supraclavicular brachial plexus block allows better visualisation of underlying structures, movement of needle and direct spread of local anaesthetic and thereby making procedure safe and effective as compared to nerve stimulator-guided technique(1).

Several studies have used potassium chloride(2) and Magnesium sulphate (3) as an adjuvant in supraclavicular block and compared the onset of sensory and motor blockade but none is existent on the efficacy of this adjuvant on post operative analgesia.Thus, the present study was undertaken to compare the efficacy of potassium chloride (0.2 mmol) and Magnesium sulphate (150mg) in providing prolonged postoperative analgesia when added to a mixture of 2% lignocaine with adrenaline 1:200,000 and 0.5% bupivacaine against a control group where normal saline was added.

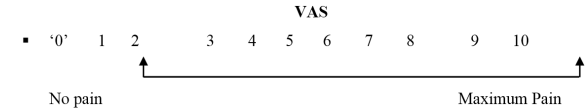
MATERIALS AND METHODOLOGY

This study was conducted after research committee approval to compare the effects of adjuvants 0.2 mmoles of KCl (group A) , 150mg of MgSO4(group B) and Normal saline(group C) to local anaesthetic mixture of 2% lignocaine(10ml) with adrenaline and 0.5% bupivacaine(10ml) in USG guided supraclavicular brachial plexus block on post operative analgesia, in patients undergoing elective surgeries of upper limb, medium duration (<90 min) on 60 patients of either sex, in the age range of 16-65 yrs, belonging to ASA I & II.

The patients were randomly divided into 3 groups of 20 each by a lottery method. We use ultrasound guidance whenever a supraclavicular block is performed in order to minimize the chance of vascular puncture. The ultrasound probe is placed in a transverse position just above the clavicle . The carotid artery and internal jugular vein are visualized. The subclavian artery is identified by moving the transducer laterally along the clavicle and directing the transducer toward the first rib. The brachial plexus at the level of the divisions appears as a "bag of grapes" lateral to the subclavian artery. The needle is inserted in-plane (parallel to the probe), and local anaesthetic solution is injected to hydrodissect between the nerves until the tip reaches the location known as the "eight ball in the corner pocket" position, bordered by the subclavian artery medially, the first rib inferiorly, and the divisions of the brachial plexus superior laterally(4,5) and following were noted.

- Haemodynamic parameters (Heart Rate, Systolic Blood Pressure, Diastolic Blood Pressure, SPO2 & Respiratory Rate) periodically.
- Side effects of addition of 0.2mmoles of KCl and 150mg of MgSO4, if any (nausea, vomiting, shivering, hypotension, bradycardia and respiratory depression)
- Post operative analgesia by - Duration of effective analgesia
- Pain score reading was recorded using visual analogue scale (VAS). It involves use of a 10 cm line on a piece of white paper and it represent patients perception of the degree of pain. It was explained preoperatively to all the patients that, one end of the line depicts '0' which represents no pain at all, while the other end depicts '10' which represents worst pain he/she has ever felt.

Patient was asked to rate the degree of pain by making a mark on the linear scale. Thus the pain score was obtained by measuring the distance from '0' end to the indicated mark.



- 0 - No Pain
- 0-3 - Mild Pain
- 3-7 - Moderate pain
- >7 - Severe pain
- 10 - Maximum pain

At the end of the procedure all the patients were shifted to the recovery room and monitored every 15 minutes for 1st hour and then every 30 minutes till they complained of severe pain (VAS>7). Inj. Tramadol 50mg i/m was given as rescue analgesia. Side effects if any were recorded.

OBSERVATION AND RESULTS

Table 1: Patients characteristics in different groups

Sex	Group A (%)	Group B (%)	Group C (%)	Total(%)
Male	15(25)	19 (31.66)	14 (23.33)	48 (80)
Female	5 (8.33)	1 (1.66)	6 (10)	12 (20)
ASA grade	GroupA (%)	Group B (%)	Group C (%)	Total (%)
I	17 (28.33)	18 (30)	15(25)	48 (80)
II	3 (5)	2 (3.33)	5 (8.33)	12 (20)
Parameter	Group A	Group B	Group C	P Value
	Mean ± SD (n=20)	Mean ± SD (n=20)	Mean ± SD (n=20)	
Age (Yrs)	30.25 ± 11.82	31.75 ± 14.01	30.8 ± 13.35	>0.05
Weight (Kg)	59.64 ± 10.02	62.45 ± 8.36	62.9 ± 11.68	>0.05

Patients Sex, ASA status, Mean age and weight in all the three groups were comparable.

Table 2: Comparison of Duration of effective analgesia VAS>7 in study groups

Parameters	Group A	Group B	Group C	F Value	P Value
	Mean ± SD (n=20)	Mean ± SD (n=20)	Mean ± SD (n=20)		
Duration of Effective Analgesia VAS>7	216.15 ± 63.06	261.25 ± 46.84	180.25 ± 16.42	15.34	<0.0001

"ANOVA" test showed that the effective duration of analgesia assessed by duration between the time of establishment of USG guided block to the time of first request of rescue analgesia was significantly prolonged in Group B MgSO4 (261.25 ± 46.84 mins) as compared to Group A KCl (216.15 ± 63.06 mins) and Group C Control (180.25 ± 16.42 mins).This means that MgSO4 prolongs the effect of Local Anaesthetic agents more significantly as compared to Kcl.

DISCUSSION

In the present study, efficacy of 0.2 mmol of Potassium chloride and 150mg of Magnesium sulphate as a postoperative analgesic, when administered along with local anaesthetic solution for USG guided supraclavicular brachial plexus block was assessed by comparing: Time for rescue analgesia i.e. Visual Analogue Scale > 7 (unbearable pain).

The duration of effective analgesia was defined as the time from brachial plexus block to the time of first rescue analgesia.

It was observed that, both the groups were comparable with respect to the patient's demographic profile.In our study requirement of postoperative analgesia was significantly less in Group B MgSO4 as compared to Group A KCL and Group C Control.

Pushparaj et al (6) in 2006 studied the effectiveness of regional anaesthesia in pain management. A wide variety of adjuvants along with local anaesthetic mixture were studied in order to enhance and prolong the duration of block, concluded that ketamine when co-administered with local anaesthetic mixture improves the quality and duration of analgesia .

Khosa , et al(7) have shown in their study that potassium chloride prolongs the total duration of analgesia when used as an adjuvant in supraclavicular block, which was similar to our observation.

Similarly several studies (3,8,9) demonstrated that when magnesium sulphate is added as an adjuvant to bupivacaine prolongs the duration of analgesia without any side effects like in our study.

CONCLUSION

- Magnesium sulphate 150mg was found to have an increased duration of effective analgesia post USG guided supraclavicular brachial plexus block as compared to Potassium chloride 0.2 mmoles. There were no significant side effects in both the study groups requiring any kind of intervention.

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