EVALUATION OF VARYING DOSES OF MAGNESIUM AS AN ADJUVANT TO ROPIVACAINE IN SUPRACLAVICULAR BRACHIAL Plexus BLOCK

ABSTRACT:

Introduction:

Peripheral nerve blockade is one of the components of comprehensive anaesthesia care because of its distinct advantages over central neuraxial blockade and general anaesthesia. Peripheral nerve blockade provides more effective analgesia with fewer side effects than opioid and other oral analgesics. Supraclavicular block once described as the “spinal of the arm” offers dense anaesthesia of the brachial plexus for surgical procedures at or distal to the elbow.

Ropivacaine is a long acting local anaesthetic that is structurally related to bupivacaine. It was developed for reducing systemic toxicity and improving relative sensory to motor block profiles.

Magnesium has been used in intravenous, intrathecal, epidural/caudal routes to improve analgesia. Its role in peripheral nerve blocks has only minimal literature and available literature has shown mixed results. Hence this study was designed to evaluate the efficacy of magnesium when added to ropivacaine in supraclavicular brachial plexus block.

Aim:

This study is aimed to assess when two different doses of Magnesium added as an adjuvant to Ropivacaine in Ultrasound guided supraclavicular brachial plexus block may enhance the duration of sensory and motor block, duration of analgesia and quality of block and side effects using various
parameters and to find out the minimum dose needed to achieve the desired effects.

The primary objectives is to assess the onset and duration of sensory and motor blockade and duration of postop analgesia.

The secondary objectives is to assess the total rescue analgesics, Visual Analog Scale (VAS) Score and side effects.

**Materials and Methods:**

Ninety patients of both sexes (18–60 years) posted for elective upper limb ortho surgeries under USG guided supraclavicular brachial plexus block were divided into three equal groups (Groups A, Group B and Group C) in a randomized, double-blind fashion. In group A \( (n = 30) \), 20 ml 0.5% ropivacaine plus 1.5 ml normal saline and in group B \( (n = 30) \), 20 ml 0.5% ropivacaine plus 100 mg MgSO\(_4\) (diluted in 1.5 ml NS) and in Group C \( (n = 30) \), 20 ml 0.5% ropivacaine plus 150 mg MgSO\(_4\) (diluted in 1.5 ml NS) were administered in supraclavicular block. Sensory and motor block onset times and block durations, time to first analgesic use, total rescue analgesic need, postoperative visual analog scale (VAS) and side effects were recorded for each patient.

**Results:**

The demographic profile of all the patients was statistically insignificant between the three groups. Our study showed that

1. On addition of magnesium to local anaesthetic, the onset of sensory and motor blockade was delayed significantly \( (P < 0.001 \) for both sensory and motor), but there was no significant difference between the two groups with 100 mg and 150 mg magnesium. \( (P \text{ value} - 0.252 \) for both sensory and motor)
2. Addition of magnesium to ropivacaine significantly prolongs the duration of sensory and motor blockade (P <0.001 for both sensory and motor) but did not have significant difference between the doses of 100 and 150 mg. (P value - 0.185 for sensory and P value - 0.164 for motor)

3. Time to request of first rescue analgesic increased significantly when magnesium is added (P <0.001), but addition of 150 mg magnesium compared to 100 mg magnesium didn’t have much difference (P value-0.464). Thus the postoperative analgesia is definitely better when magnesium is added.

4. The total number of rescue injections in first 24 hours was less when magnesium is added similar to the above findings and thus the postoperative opioid consumption was less in magnesium group but without significant difference between 100 and 150 mg of magnesium.

5. Minor complications like nausea and vomiting were rarely encountered and which was easily managed.

**Conclusion:**

From this study it is concluded that on addition of both 100 mg and 150 mg magnesium sulphate to 0.5% ropivacaine in supraclavicular brachial plexus block significantly prolongs the duration of sensory and motor blockade and significantly reduces the requirement of rescue analgesic in postoperative period but delays the onset time of sensory and motor blockade.

But both 100 mg and 150 mg magnesium had similar efficacy of postoperative analgesia. Thus it is inferred that 100 mg magnesium is enough in supraclavicular block to achieve the desired effects.