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Comparison of Post-operative Mean Opioids Consumption in Patient given Preoperative Gabapentin and Placebo Undergoing Major Laparotomies for Lower Abdomen and Pelvis

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ABSTRACT

Objective:- To compare the efficacy of lignocain with lignocain and magnesium sulfate for intravenous regional anesthesia. **Material and methods**:- This Ranodomized controlled trial was conducted at Bahawal Victoria Hospital, Bahawalpur and Nishtar Hospital Multan. The patients were divided in two equal groups. In group L, 55 patients received Lignocain alone and in group M, 55 patients received lignocaine with magnesium sulfate. The two groups were compared for the efficacy. **Results:-** Mean VAS was 4.36 + 2.40 in group L and 3.55+ 2.47 in group M ($p>0.05$). The efficacy of lignocaine alone was observed in 21 (38.2%) patients while efficacy of lignocaine with magnesium was seen among in 32 (58.2%) patients. p-value > 0.05. **Conclusions:-** The use of magnesium along with lignocaine is found to be more effective than lignocaine alone for IVRA.

Key words:- Intravenous regional anesthesia; lignocaine; magnesium sulfate

INTRODUCTION

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in term of such damage. The word “pain” is derived from the Latin word “Poena” meaning punishment. Pain like poverty is always with us. After the birth of civilization, it took man a long time to get around to doing something about alleviating pain[1]. The relief of pain during surgery is the aim of anaesthesia. Any expertise required in this field should be extended into the postoperative period[2].

Postoperative pain is a common and challenging problem (upto 30% of the patients suffer from moderate to severe pain after surgery)[3,4]. Uncontrolled post-operative pain produces a neurohumeral response with the release of catecholamines and activation of the sympathetic nervous system. This results in a number of physiological changes that lead to post-operative morbidity like tachycardia, hypertension, anxiety, atelactasis, fear, sleep disturbance, prolonged hospital stay and increase in cost[3,4]. Despite many advances in pain management, it still remains a serious cause of

sufferings to the patient. The aim of postoperative analgesia is not only to reduce the pain intensity but is also to save the patient from the side effects of the analgesic drugs[5]. One area of growing concern for the anesthesiologist involves the perioperative assessment and management of the perioperative pain[6]. Effective postoperative analgesia improves the functioning of the organs following surgery and shortens the hospital stay[7,8]. Post operative pain relief is a very important part of balanced anaesthetic technique and if not controlled in time, may adversely effect the post operative morbidity[9].

Regional and general anaesthesia are commonly used for surgical procedures. General anaesthesia refers to the loss of ability to perceive pain associated with loss of consciousness produced by intravenous or inhalation anaesthetic agents[10]. General anesthesia involves the use of thiopentone for induction, tracheal intubation facilitated by suxamethonium, positive-pressure ventilation of the lungs with a nitrous oxide/oxygen mixture plus a volatile agent, and a muscle relaxant. The risks include the aspiration of stomach contents, awareness of the surgical procedure (due to inadequate anaesthesia), failed intubations, and respiratory problem[11].

Regional anesthesia is the use of local anesthetics to block sensations of pain from a large area of the body, such as an arm or leg or the abdomen. Regional anesthesia allows a procedure to be performed on a region of the body without your being unconscious[12].

Intavenous regional anesthesia is one of the safest and most reliable forms of anesthesia for short surgical procedures on upper extremity[13]. However, it has been limited by tourniquet pain and inability to provide post operative analgesia[14]. An ideal IVRA solution should have rapid onset, reduced dose of local anesthetic and prolonged anesthesia[15]. At present this may only be achieved by addition of various adjuncts to local anesthetic like morphine, fentanyl, clonidine, tramadol[16] and NSAIDS like Ketorolac[17]. Parenteral Magnesium has been used on an empirical basis as an anti dysrythmic treatment for eclampsia and for intra operative and post operative analgesia.

The mechanism of analgesic effect of Magnesium is not clear but interference with calcium channels and N-methyl-d-aspartate seems to play an important role[18].

In a study by Narang et al, compared the effect of magnesium sulfate as an adjuvant to lignocain in 30 paitents with ASA physical status I or II patients undergoing upper limb surgery under tourniquet receiving IVRA. This was a double blind randomized clinical trial. Assessment was by observing the time of onset of sensory and motor block and tourniquet pain. The patients were divided in two groups: group L (those who received lignocain) and group M (those who received lignocain with magnesium). The mean time of onset of sensory block in lignocain group was 12.40 and 3.47 minute in group L and M respectively ($P < 0.001$). The average times of onset of motor block in groups L and M were 17 and 6 minutes respectively ($P < 0.001$). There was a statistically significant difference in visual analogue scale for tourniquet pain at 10 and 30 minutes after tourniquet inflation. At 10 minutes the mean VAS was 3 in goup L and 0 in group M, and at 30 minutes, it was 4 in group L and 3 in group M. No torniquet pain was seen in 13.4 % patients in group L and 33.3 % patients in group M. So, it was concluded that adjunct of magnesium sulfate with lignocain hastens the onset of sensory and motor block and decreases tourniquet pain (improved VAS scores)[19].

MATERIAL AND METHOD

This Randomized controlled trial was conducted at Bahawal Victoria Hospital, Bahawalpur and Nishtar Hospital Multan. The patients were divided in two equal groups. In group L, 55 patients received Lignocain alone and in group M, 55 patients received lignocaine with magnesium sulfate. The two groups were compared for the efficacy. Chi-square test was applied for statistical difference. (p-value < 0.05 was taken as significant. Data was collected on special designed proforma.

RESULTS

In Group L, the mean age of the patients was 35.93 ± 8.77 years [range 20 – 50]. There were 20 (36.4%) patients of age range of 20 – 30 years, 15 (27.2 %) patients of age range of 31 – 40 years and 20 (36.4%) patients of age range of 41 – 50 years. In Group M, the mean age of the patients was 35.65+8.09 years and age range was 21 – 50 years. Of the 55 patients in the study, there were 13 (23.6 %) patients of age range of 20 – 30 years, 28

(50.9 %) patients of age range of 31 – 40 years and 14 (25.5 %) patients of age range of 41 – 50 years.

In group L, there were 36 (65.5%) male patients and 1 (34.5%) were female. The female to male ratio in this group was 1:1.89. In group M, there were 33 (60%) male patients and 22 (40%) were female. The female to male ratio in this group was 1:1.5. The patients were also distributed according to American Society of Anaesthesiologist Society (ASA) Classification. Only two classes, ASA Class 1 and ASA Class 2 were included in the study. In group L, there were 35 (63.6%) patients who were included in ASA Class 1 and 20 (36.4%) patients who were included in ASA Class 2. In group M, 38 (69.1%) patients and 17 (30.9%) patients were included in ASA Class 1 and ASA Class 2, respectively. The mean dose of tramadol consumed by the patients in group L was 4.36 $\pm$ 2.40 and in group M was 3.55$\pm$ 2.47. The two groups were also compared for any statistical difference. Student t-test was applied and $p > 0.05$ which showed that there was not any significant difference between the two groups. In Group L, there were 34 (61.8%) patients who suffered from tourniquet pain and 21 (38.2 %). In group M, there were 23 (41.8%) who suffered from tourniquet pain, while no pain was observed in 32 (58.2%) patients. In Group L, lignocain was found effective in 21 (38.2%) patients while it was not effective among 34 (61.8%) patients. In group M, lignocain with magnesium sulfate was found effective in 32 (58.2%) patients while it was not effective in 23 (41.8%) patients. The two groups were also compared with each other for the efficacy. Chi-square test was applied. There was no statistical difference found between the two groups ($p > 0.05$).

DISCUSSION

This study compared the efficacy of lignocain alone versus lignocain with magnesium sulfate in IVRA and the results were in favor of lignocain with magnesium sulfate. This was found effective in 58.2% patients while lignocain alone was found effective in 38.2% ($p < 0.05$). In literature, there are various studies which have compared the magnesium sulfate as an adjuvant to the lignocain with lignocain alone for IVRA. Kashefi P, et al[20] compared the outcome of lignocain alone with lignocian with magnesium sulfate for the IVRA for upper limb surgery. They included 40 patients who were divided in two equal groups. One group receiving lignocain alone and other receiving lignocain with magnesium sulfate. In their study, they studied the effect of magnesium on various parameters, like sensory and motor block onset and recovery times, hemodynamic variables, tourniquet pain, and analgesic use, etc. They observed that sensory block onset time was significantly shorter in lignocain with magenesium sulfate group (6.20 ± 2.35 versus 4.10 ± 2.22). Similarly, less time was required in achieving motor block (10.20 ± 3.92 7.10 ± 2.61). The tourniquet pain calculated by VAS was 2 (1-4) for lignocain alone and 1 (0-3) for lignocain with magnesium. The result was significantly significant. The tourniquet pain was also calculated by VAS in our study. However, the VAS in both groups was much higher than their study i.e. 4.36 $\pm$ 2.40 in lignocain group and 3.55$\pm$ 2.47 in lignocain with magnesium sulfate group. This may be due to the reason that in study by Kashefi P, et al. 20 cc of lignocain was used which is almost a higher dose. So, the overall pain score was low in their study.

In another study by Narang S, et al[19] the lignocain was compared with lignocian with magnesium for the IVRA. This study was conducted among 30 patients who were divided in two equal groups. In this study, the assessment of tourniquet pain score was done on the basis of the visual analogue scale (VAS) (O=no pain and 10=worst pain imaginable). When tourniquet pain was > 3 on the VAS, patients were given fentanyl 1 [micro] g/kg intravenously. The mean tourniquet pain after 30 min was 4(1-9) in lignocaine alone group and 3 (0-3) in lignocaine with magnesium sulfate group. P< 0.007 which was statistically significant. The findings of this study were also similar to that with our study in that adding magnesium to lignocaine is associated with less tourniquet pain than lignocaine alone. However, in their study, an interesting observation was made. They noticed that adding magnesium to the lignocaine may reduce the tourniquet pain but increases the frequency of injection pain. They found that of the patients in magnesium with lignocaine group, 66.7% reported moderate to severe pain while the drug was being injected, compared to 20% in lignocaine alone group (P=0.011). They concluded that adding

magnesium to lignocaine in IVRA may reduce the tourniquet pain but may increase the injection pain.

Another study was conducted by Turan A, et al[14] on 30 patients undergoing IVRA. The patients were divided in two equal groups. Of the other variable, tourniquet pain was also calculated based on VAS. It was found that VAS scores of tourniquet pain were lower in magnesium with lignocaine group i.e. min 3 (1–5) as compared to lignocaine alone group at 50 min i.e. 4 (2–6) ($P < 0.001$)

CONCLUSION

The addition of magnesium to lignocaine in IVRA demonstrated decreased tourniquet pain and better efficacy than lignocaine alone. So, it is recommended that magnesium sulfate should be routinely used for the IVRA along with lignocaine in our setup. However, multi-center studies for a longer period are required to better estimate of outcomes.

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