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PREEMPTIVE EFFECT OF A SINGLE DOSE OF IV MGSO4 ON POSTOPERATIVE PAIN RELIEF AFTER LOWER ABDOMINAL SURGERY.

Anaesthesiology

Dr. C.K. Vyas Senior Professor (Anaesthesia), Department of Anaesthesiology and critical care, SMS and attached group of hospitals, Jaipur.

Sonali Beniwal* Assistant Professor (Anaesthesia). Department of Anaesthesiology and critical care, SMS and attached group of hospitals, Jaipur.*Corresponding Author

ABSTRACT

BACKGROUND: We evaluated the effect of single intravenous bolus of MgSO4 on pain intensity in patients undergoing surgery for lower abdomen.

Methods: The Magnesium group (n =25) and the control group (n=25) received MgSO4 and isotonic saline, respectively, over 30 min before the induction of anesthesia. Intra operatively PR, SBP & DBP were noted. Postoperative pain (VAS) at rest was noted

Results: Demographic data, Mean baseline PR, SBP & DBP were comparable in both the groups. Mean duration of analgesia was longer in MgSO4 group. Mean total dose of analgesic requested and VAS score was lesser in MgSO4 group. MgSO4 group was more sedated. Side effects like nausea & vomiting were more in control group.

Conclusion: Patients receiving MgSO4 during preop period have better pain relief, more sedation and fewer analgesic requirements of rescue analgesics without any major side effects.

KEYWORDS

MgSO4, Postoperative Pain, Lower abdominal surgery.

INTRODUCTION

Most patients who undergo surgery experience acute postoperative pain, but evidence suggest that less than half report adequate postoperative pain relief. Many preoperative, intra operative and postoperative interventions and management strategies are available for reducing and managing postoperative pain. These include variety of pharmacological and non pharmacological modalities.

Non pharmacological modalities of pain management include transcutaneous electrical nerve stimulation, ultrasound, superficial heat, cryotherapy, manipulation and mobilization, psychological interventions like biofeedback and cognitive behavioral therapy etc.

In pharmacological management wide range of drugs are used to manage pain resulting from inflammation in response to tissue damage ,chemical agents/pathogens (nociceptive pain) or nerve damage (neuropathic pain).They include NSAIDS like aspirin, ibuprofen, naproxen, diclofenac. Opioids like morphine, codeine, fentanyl, tramadol, buprenorphine. Other adjuvant drugs which are given for neuropathic pain include Amitriptyline, Gabapentin, Pregabaline, duloxetine.

Mg has been used in anesthesia & cardiology as antiarrthymics and in obstetrics as anticonvulsant in eclampsia patients .Recently Mg has been reported to produce important analgesic effects including the suppression of neuropathic pain, potentiation of morphine analgesia and attenuation of morphine tolerance. Analgesic properties of magnesium are believed to be due to regulation of calcium influx into the cell and antagonism of NMDA receptors in the CNS. NMDA receptor antagonist can prevent the induction of central sensitization due to peripheral nociceptive stimulation and abolish the hypersensitivity once it has been established.

In this randomized double blind interventional analytic study , based on the hypothesis that Mg can reduce postoperative pain and prevent increase of pain intensity, we examined the extent to which Mg reduce postoperative pain for patients undergoing lower abdominal surgery.

METHODS

The study was approved by the institutional review board of S.M.S. Medical College. Written informed consent was obtained from all the patients before participation. The study was conducted in SMS Hospital between Jan to Oct 2017.

The 50 patients (age range 15-50 yr) who participated in this study had ASA physical status 1 & 2 and were undergoing lower abdominal surgery of 1-1.5 hrs duration .Preoperative exclusion criterion include history of chronic diseases like hypertension, varying degree of heart blocks, DM, respiratory disease, myopathy, neurological disorders, Pregnant women, BMI ≥30 KG/M2, patients on treatment with CCB or Mg, impaired renal or hepatic function, Inability to comprehend VAS score.

The 50 patients were preoperatively randomized into 2 groups as follows: the Mg group received magnesium sulphate (50 mg/kg) in 250 ml of isotonic saline over 30 min. The control group received the same volume of isotonic saline over 30 min. Total 50 such patient were selected on the first cum first serve basis and were allocated to different groups using chit and box method. To reduce subject and observer bias double blind technique was used.

One day prior to surgery preanaesthetic check up and all routine blood investigations, ECG, chest X ray were done. After taking informed consent and confirming overnight fasting patient was taken in the recovery room and baseline vitals were recorded.

After an 18 G IV cannula had been inserted, inj MgSO4 50mg/kg mixed in 250 ml of inj isotonic saline and infused over 30 min before induction of anesthesia. Pulse rate & B.P. monitored at 10, 20, and 30 min intervals during this period.

Upon arrival in O.T., pt was taken on the O.T. table and all usual monitoring were applied. General Anesthesia administered by inj Glycopyrolate 0.005mg/kg, inj Fentanyl 2u/kg, Inj Thiopentone 5mg /kg & inj Sch 1mg/kg was given to facilitate intubation with appropriate size of ET tube. During surgery anaesthesia was maintained with isoflurane and nitrous oxide in O2 and inj Atracurium 0.5 mg/kg loading dose followed by 0.1mg/kg SOS.

During surgery BP, PR,SpO2 and any fluid and drug requirement were noted on 5,10,20,30,40,50,60,70,80 and 90 min after induction of anaesthesia . Postoperatively residual neuromuscular blockade was reversed with inj Neostigmine 0.05/kg and inj Glyco0.02mg/kg.

Pt at rest was evaluated by using a 0-10 cm. Visual Analogue Score (VAS) or by using a 0-4 verbal rating score (VRS) at emergence from anaesthesia and ½, 1, 2, 4, 6, 12 and 24 hrs after surgery.

Intraoperatively hypotension was SABP <90mmHg or a decrease in SABP ≥30% from baseline values and treated by incremental doses of ephedrine 5mg IV until the correction of SABP. Bradycardia HR < 55/min & treated with incremental doses of atropine 0.5mg IV.

Duration of analgesia was defined as time from extubation to 1st dose of analgesic requested. During 1st four hours pt was kept in the recovery room and rescue analgesics was given at VAS ≥ 4 in the form of inj Diclofenac 75 mg iv.

There after pt was sent to ward and inj Diclofenac i.m. was given on demand. The timing & dosage of rescue analgesia and total consumption of inj Diclofenac during first 24 hrs was noted.

RESULTS:

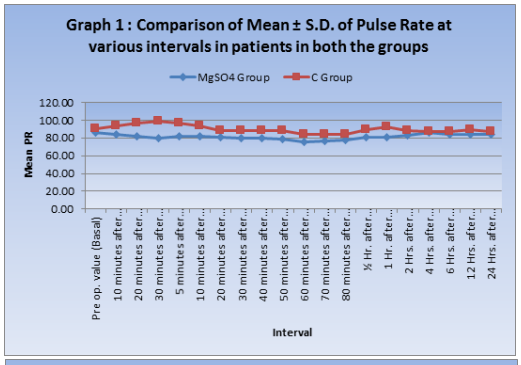
The mean age of the patients was 36.04 ± 10.38 years in MgSO4 group and 33.16 ± 9.51 years in Control group. There was no significant difference in mean age of patients between two groups (p>0.05). The mean weight of the patients was 53.8 ± 8.07 kg in MgSO4 group and 56.04 ± 8.70 kg in C group.

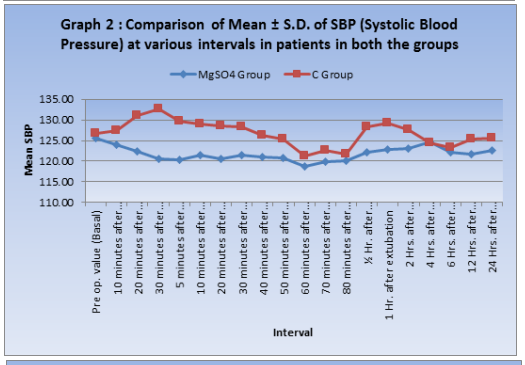
There were no significant differences in the demographic data (Age, Sex and ASA grade) between the two groups.

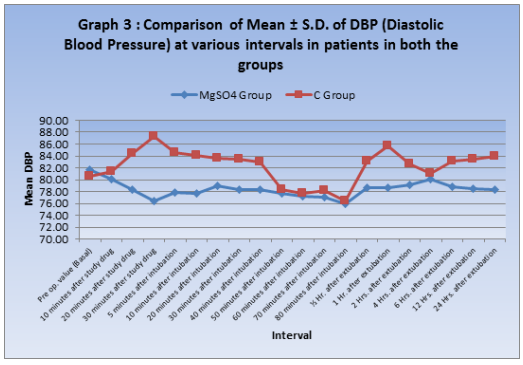
Mean baseline pulse rate, mean baseline Systolic B.P. and Mean baseline Diastolic B.P. were comparable in both the groups.

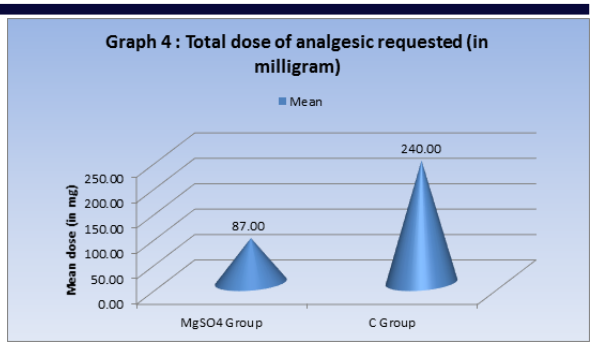
The mean duration of analgesia was 189.60 ± 18.70 minutes in MgSO4 group and 24.40 ± 5.16 minutes in C group. The mean dose of total analgesia requested was 87.00 ± 27.49 mg in MgSO4 group and 240.00 ± 30.00 mg in C group. Pain in postoperative period was significantly lower in MgSO4 group in comparison to control group at 1, 2, 4, 6, 12 and 24 hrs postoperatively.

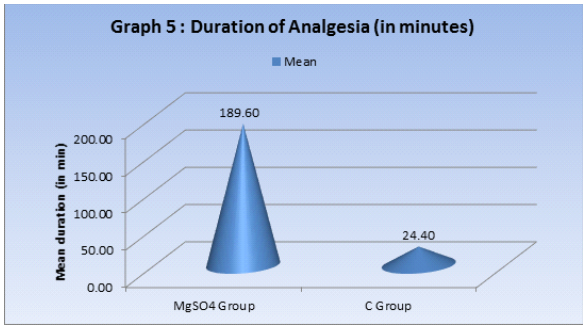
Patients receiving MgSO4 were found to be more sedated in the postop period as compared to control group. All the patients in both groups were comfortable throughout the postop period and there were no episodes of hypo or hyperventilation. There were no significant mean changes in respiratory rate (RR) in both the groups (p.0.05).There were no significant difference in mean duration of surgery in both the groups (p>0.05).The occurrence of nausea and vomiting were more in C group than the MgSO4 group. But these adverse effects were statistically insignificant management.

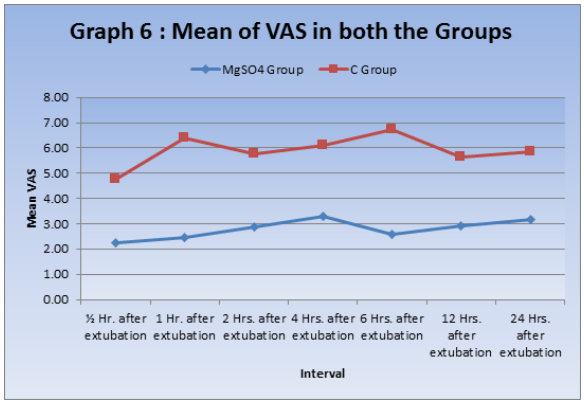


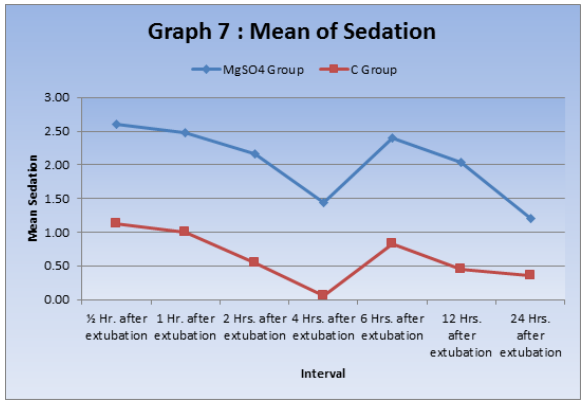












DISCUSSION

Our study has shown that infusion of MgSO4 50mg/kg given before induction of anaesthesia was associated with less postoperative pain in patients undergoing lower abdominal surgery. The dose we have used is without any adverse effects as shown by several studies.

Also in our study patients receiving MgSO4 were found to be more sedated than control group, although they were easily arousable. However it is well known that Mg may induce hypotension directly by vasodilatation as well as indirectly by sympathetic blockade and inhibition of catecholamine release. Whereas we did not observe any hypotensive episode in our patients treated with MgSO4. None of our patients had any significant bradycardia that requires treatment.

CONCLUSION

Administration of IV MgSO4 50 mg/kg preop significantly reduces

postop pain in patients undergoing lower abdominal surgery. Patients receiving MgSO4 during preop period have better pain relief, more sedated and fewer requirements of rescue analgesics in the postop period, without any major side effects.

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Conflicts of interest

There are no conflicts of interest.

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