



Effect of Intra Operative Magnesium Sulphate on Pain Relief after Laparoscopic Cholecystectomy

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Abstract

Background and Aim: Laparoscopic cholecystectomy is the gold standard for treatment of symptomatic cholelithiasis. Laparoscopic cholecystectomy procedure offers several advantages such as a reduction in stress response, postoperative pain, short recovery time, and cosmetic appearance. we aimed at evaluating the postoperative analgesic efficiency of magnesium sulphate as pre emptive analgesic in patients undergoing laparoscopic cholecystectomy.

Materials and Methods: Sixty patients with ASA Grade I and Grade II undergoing laparoscopic cholecystectomy were included in study and divided in two groups. Patients in magnesium group(group MS)received i.v MGSO₄ 50 mg/kg in 100ml of 0.9% normal saline during Pre induction time and patients in the control group (group NS) received 100ml of 0.9% normal saline .Pre medicated with injection glycopyrolate 0.01mg/kg, inj midazolam 0.03 mg/kg, inj. fentanyl 2µgm/kg was given to both groups. Effect of Magnesium sulphate infusion on post operative analgesic efficiency based on visual analog scoring, total tramadol consumption during first postoperative day, time for first rescue analgesia, post operative haemodynamic variables heart rate and MAP were assessed.

Result: Comparison of VAS scores ,at the time of extubation i.e 0 hr,2 hr,4 hr has statistically significance of P value i.e >0.05. With lower VAS scores in magnesium group compared to normal saline group. At 8 hr, 12 hr,24 hr has no statistical significant value between two groups.(P Value>0.05) Post operative tramadol consumption has significant difference (P<0.05) between magnesium sulphate and normal saline group. Tramadol consumption was more in normal saline group than magnesium group. There is a significant P value (P<0.05) for time for first rescue analgesia between magnesium and normal saline groups. The time taken for rescue analgesia was longer duration in magnesium group than normal saline group. With comparison of heart rates in 0 hr,2 hr postoperative period there is a statistically significant P value (P<0.05)observed. At 4 hr,8 hr,12 hr,24 hr there is no significance between among groups.(P value >0.05 Magnesium sulphate group has lesser incidence of side effects like shivering and post operative nausea and vomiting ,but more patients experienced sedation than normal saline group.

Conclusion: magnesium sulphate was a good pre-emptive analgesic that has better VAS scores and reduces the postoperative tramadol consumption than normal saline group with minimal side effects.

Keywords: laparoscopic cholecystectomy, preemptive analgesia, magnesium sulphate.

Introduction

Laparoscopic cholecystectomy is the gold standard for treatment of symptomatic

cholelithiasis¹ (Gerges FJ et al). Laparoscopic cholecystectomy procedure offers several advantages such as a reduction in stress response,

postoperative pain, short recovery time, and cosmetic appearance² (Leonard IE et al), but has no overall effect on postoperative mortality³ (Mc Mahon AJ et al). One of the major advantages of laparoscopic cholecystectomy over open cholecystectomy is reduced postoperative pain⁴ (WILLS VL et al) although it still remains.

The major goal in postoperative pain management is to minimize the dose of medications and lessen side effects, while still providing adequate analgesia⁵ (Katz J et al). Therapies that have been in trials include NSAIDS⁶ (Liu et al), intravenous opioids⁷ (Na guib et al), intravenous ketamine, peripheral local anaesthetics⁸ (Pasqualucci), caudal and epidural analgesia⁹ (Fujji et al), dextromethorphan and gabapentin¹⁰ (Kissin I et al). The analgesic properties of opioids in the treatment of acute, intense postoperative pain after surgery are well accepted¹¹. However, to hasten recovery and minimize opioid-related side effects such as sedation, nausea and vomiting and respiratory depression, prophylactic use of opioids in postoperative pain is avoided^{12,13} (Marret E, White PF et al).

The concept of pre-emptive analgesia was introduced demonstrating that a post injury hypersensitivity results via a central mechanism¹⁴ (C.J Woolf et al). The effect of magnesium on perioperative analgesic requirements was first evaluated by Koinig and his colleagues in patients with identical levels of surgical stimulation. Magnesium Sulphate is an antagonist of N-methyl -D-aspartate (NMDA) receptors and its associated channels¹⁵ (R.D Miller et al) and regulation of calcium influx into the cell¹⁶ (Moher D et al). This causes modulation of acute pain ,reducing post surgical pain intensity and dosage of analgesics¹⁷ (Wilder -Smith CH et al). Seyhan et al have reported that magnesium sulphate boluses were effective for postoperative pain relief after gynaecological surgery^{18,19} (Fucs-Budder et al, Kussman B et al). However they had used continuous infusion in addition to initial bolus of magnesium sulphate in their studies which caused bradycardia and delayed extubation time which

can be attributed to the infusion of Mgso4²⁰ (Seyhan et al). Iva Bacak Kochman²¹ et al studied effect of low dose Mgso4 (7.5 mg/kg) as analgesic agent after induction in patients undergoing laparoscopic cholecystectomy as it is only bolus dose of Mgso4 given for control of adrenergic response during intubation reduced only early post operative pain .Study conducted by O Menten et al²² on post operative analgesic efficacy of single dose Mgso4 (50mg/kg) after laparoscopic cholecystectomy measured by VAS scores .On this background our study was done to evaluate the post operative analgesic efficacy of single dose of magnesium sulphate(50mg/kg) as pre emptive analgesic after laparoscopic cholecystectomy measured in addition to VAS scores, total tramadol consumption and time for first rescue analgesia, postoperative haemodynamic parameters and side effects if any.

Aim

The aim of the study is to evaluate the postoperative analgesic efficiency of magnesium sulphate as pre emptive analgesic in patients undergoing laparoscopic cholecystectomy

Objectives

1. To study effect of Magnesium sulphate infusion on post operative analgesic efficiency based on visual analog scoring.
2. Total tramadol consumption during first postoperative day
3. Time for first rescue analgesia
4. Post operative haemodynamic variables heart rate and MAP
5. To study the drug side effects if any.

Materials and Methods

This is a prospective randomized controlled study to evaluate the effect of intra operative Mgso4 on postoperative analgesia in patients undergoing laparoscopic cholecystectomy. After obtaining Institutional Ethical committee clearance and written informed consent from the patients , a randomised prospective study was conducted at

King George Hospital, vishakapatnam. Randomisation done based on envelope method. Study contain Sixty patients with ASA Grade I and Grade II undergoing laparoscopic cholecystectomy were included in study and divided in two groups. Patients in magnesium group(group MS) received i.v MGSO4 50 mg/kg in 100ml of 0.9% normal saline during Pre induction time and patients in the control group (group NS) received 100ml of 0.9% normal saline

Study Design: Group 1: Patients with MGSO4 (MS) Group 2: Patients without MGSO4 (NS)

Inclusion Criteria

- 1) Patients who give informed written consent
- 2) Patients aged between 20 to 50 years.
- 3) Patients belonging to ASA grade I and II

Exclusion Criteria

- 1) Patients who refuse to give informed onset.
- 2) Patients with systemic disorders
- 3) Patients taking calcium channel blockers
- 4) Heart block/dysrhythmias
- 5) ASA grade III and IV
- 6) Patient refusal, 7)Psychiatric illness that would interfere with perception and assesment.

Materials Required

- Completely checked Anaesthesia workstation
- Appropriate size endotracheal tubes.
- oxygen, suction apparatus.
- Drugs-Magnesium Sulphate, inj Atropine and inj Mephetramine and other emergency drugs.
- Monitors- ECG, NIBP, SPO2, Etc2.

Pre anaesthetic Check up and Preoperative Evaluation:

Patients posted for the surgery underwent thorough preoperative evaluation which included proper history, physical examination and relavant investigations. At the pre anaesthetic interview, the patients were familiarized with the visual

analogue scale (VAS). All patients were pre medicated with anxiolytic Oral diazepam 0.2mg/kg was given the night before the surgery. Patients were advised fasting for 6hrs before surgery. On arrival into pre-operative room, patients were explained about VAS and thereafter, a 18G i.v cannula was placed into the antecubital vein and ringer lactate infusion was started. No premedication was given. Patients were shifted to operating table.

Intra operative: Pre medicated with injection glycopyrolate 0.01mg/kg, inj midazolam 0.03 mg/kg, inj. fentanyl 2µgm/kg was given to both groups. Group 1-Magnesium sulphate at the dose of 50 mg/kg in 100 ml of isotonic 0.9% sodium chloride solution was given intravenously over 15 to 20 minutes, immediately before induction of anesthesia. Group II- Same volume of isotonic 0.9% sodium chloride solution intravenously over 15 to 20 minutes in the operative room just before induction of anesthesia. Induction done with propofol 2mg/kg, paralysed with vecuronium 0.1 mg/kg intubated with appropriate sized endotracheal tube. During the administration, patients intra operative pulse, blood pressure, and oxygen saturation were measured. Ringer lactate infusion started as 10ml/kg body wt with proper monitoring. Pneumoperitonium was created and maintained with 10-14 mm Hg intra abdominal pressure. After surgery completed patients were reversed with inj Neostigmine 0.05mg/kg and inj. glycopyrolate 0.02mg/kg after full recovery.

Post Operative Period: Postoperatively pain was evaluated using a 0-10 visual analog scale scoring. (VAS 0-10, with 0 - No pain at all and 10 - Worst pain imaginable) at emergence from anesthesia (ohr) and at 2, 4, 8, and 12, 24 hrs after surgery. VAS score of > 3 was considered inadequate analgesia .Pain relief in the postoperative period was provided by injection Tramadol 50mg as supplemental doses based on visual analog scoring. Along with VAS scores, total tramadol consumption per day calculated, time duration for first rescue analgesia was measured. Post

operative haemodynamic variables were measured.

Statistical Analysis: Descriptive statistics was done for all data and suitable statistical tests of comparison were done. These included the mean and standard deviation (SD) for quantitative variables.

Analysed by Student t unpaired test. Significance for all set point was set at P <0.05.

Observations and Results

Sixty patients were taken into study with ASA grade I and II scheduled for elective Laparoscopic cholecystectomy. Patients were randomised based on envelope method.

Table 1 Comparison of Demographic Profiles

DEMOGRAPHIC CHARACTERISTICS	MS GROUP	NS GROUP	P VALUE
AGE	37.13±7.29	35.1±7.1	0.856
GENDER	16:14	18:12	
WEIGHT	64.8±9.46	65.53±7.20	0.36
DURATION OF PNEUMOPERITONIUM	65.33±17.41	63.33±14.68	0.63
ASA	12:18	17:13	
			P>0.05

P value <0.05 is considered as significant; >0.05 is considered as non significant

Data suggests there is no statistical significance in age, gender, weight and in duration of pneumoperitonium among MS and NS group

Graph 1 Demographic Variables among two Groups

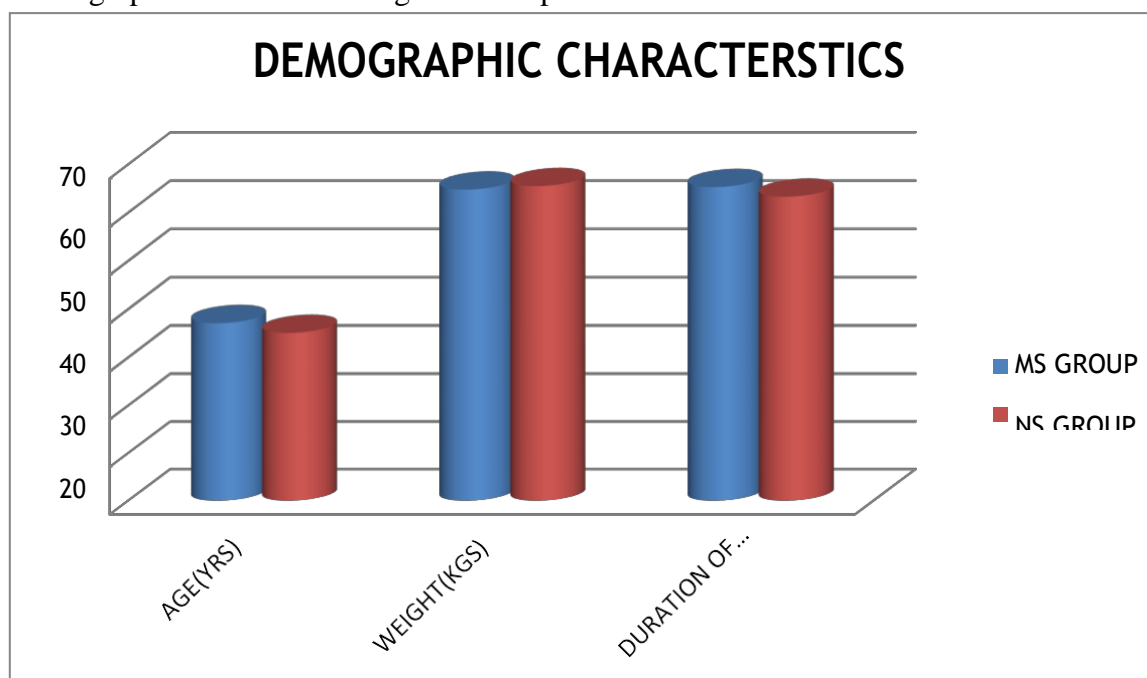


Table 2 Comparison of Vas Scores

POST OPERATIVE DURATION	MS GROUP	NS GROUP	P VALUE
0 HR	4.6±1.11	5.76±1.30	0.0005*
2 HR	4.2±1.3	5.1±1.01	0.004*
4HR	3.6±1	4.13±0.95	0.03*
8 HR	3.4±1.1	3.3±0.97	0.71
12HR	2.7±1	2.46±0.99	0.35
24 HR	2.6±1.04	2.5±0.92	0.69

*P value <0.05 is significant, P>0.05 is not significant.

Above table shows comparison of VAS scores ,at the time of extubation i.e 0 hr, 2 hr,4 hr has statistically significance of P value i.e >0.05. With

lower VAS scores in magnesium group compared to normal saline group.

At 8 hr, 12 hr, 24 hr has no statistical significant value between two groups. (P Value>0.05)

Graph 2-Vas Score Comparison among Groups

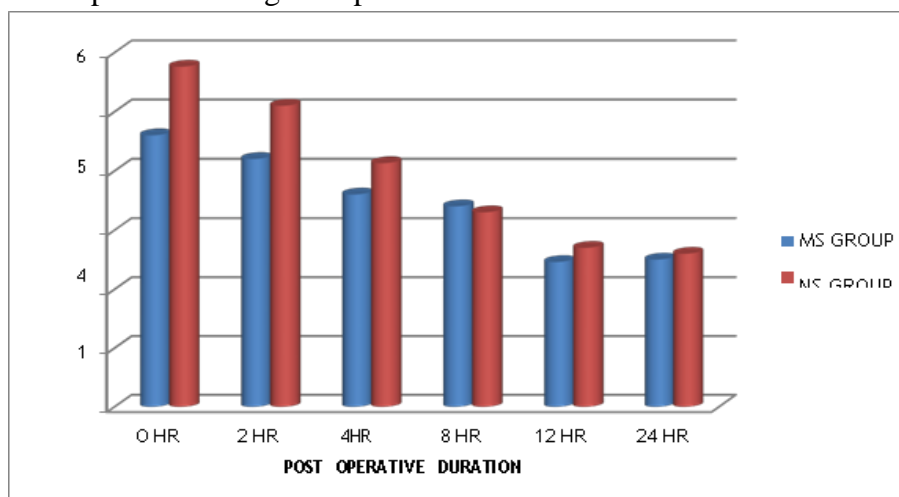


TABLE 3- TRAMADOL CONSUMPTION PER DAY IN mg

GROUPS	MS GROUP	NS GROUP	P VALUE
MEAN AND STANDARD DEVIATION	248±55.5	298.33±66.43	0.002*

P value <0.05 is significant; p value >0.05 is insignificant.

Post operative tramadol consumption has significant difference (P<0.05) between magnesium sulphate and normal saline group.

Tramadol consumption was more in normal saline group than magnesium group.

TABLE 4-INTER GROUP COMPARASION OF TIME FOR FIRST DOSE OF TRAMADOL

GROUP	MS	NS	P value
MEAN AND SD	82.33±22.90	44.33±22.27	0.001*

*P value <0.05 is significant; p value >0.05 is insignificant.

There is a significant P value (P<0.05) for time for first rescue analgesia between magnesium and normal saline groups. The time taken for rescue

analgesia was longer duration in magnesium group than normal saline group.

Graph 4-Time for first Rescue Analgesia

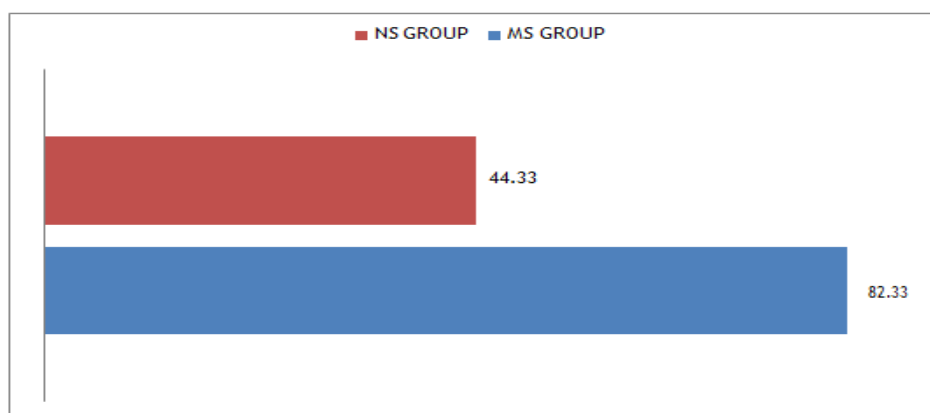


TABLE 5-COMPARISION OF HEART RATES AMONG TWO GROUPS

	MS GROUP	NS GROUP	P VALUE
0 hr	75.4±17	85.06±18.93	0.042*
2 hr	77±14	89.26±14.07	0.001*
4 hr	84±15	84.53±11.81	0.87
8 hr	79±9.9	80.06±8.92	0.66
12 hr	74.1±12.7	75.46±11.38	0.66
24 hr	73.6±10.8	74.12±8.67	0.83

P value<0.05-is significant, P>0.05 –not significant.

With comparison of heart rates in 0 hr,2 hr postoperative period there is a statistically significant P value (P<0.05) observed. At 4 hr,8

hr,12 hr,24 hr there is no significance between among groups.(P value>0.05

Graph 5-Postoperative Comparison of Heart Rates

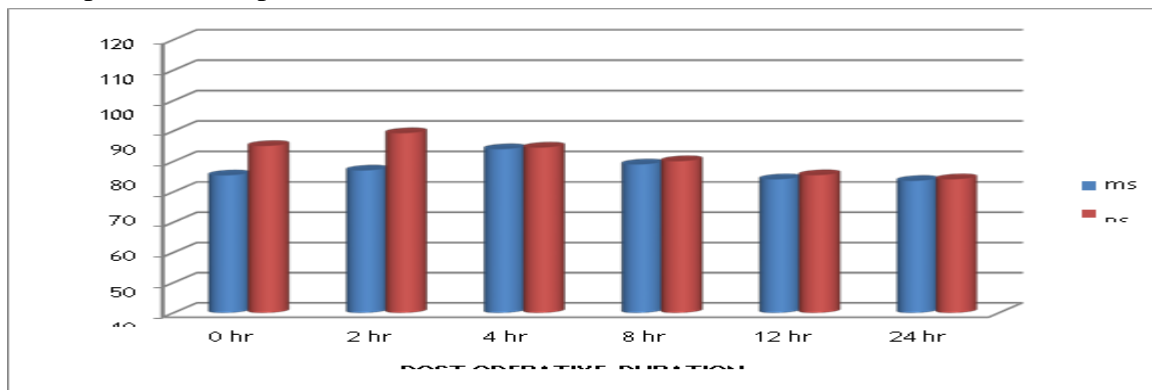


TABLE 6-COMPARISION OF MEAN ARTERIAL PRESSURE

Duration	MS Group	NS Group	P Value
0 HR	94.7±8.48	104.55±8.17	0.0001
2 HR	98.78±8.07	107.51±8.71	0.0002
4 HR	97.8±7.04	99.13±6.61	0.45
8 HR	97.97±8.13	98.28±7.75	0.88
12 HR	98.13±7.28	98.5±6.71	0.83
24 HR	98±5.32	98.2±5.68	0.88

Among two groups there is a statistical significance in MAP at 0 hr, 2hr (P<0.05) . No

significance was observed at 4 hr, 8 hr, 12 hr and 24 hr (P >0.05)

Graph 6-Variation of Mean Arterial Pressures

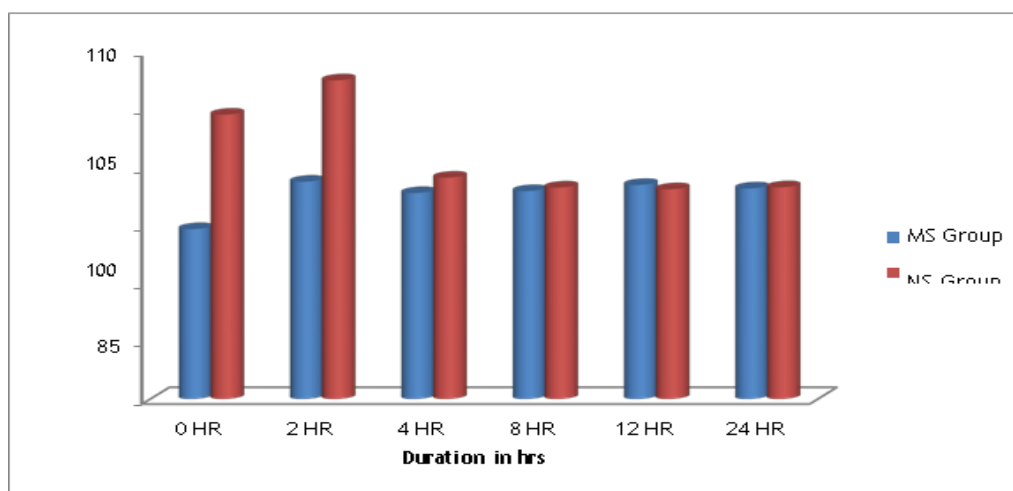


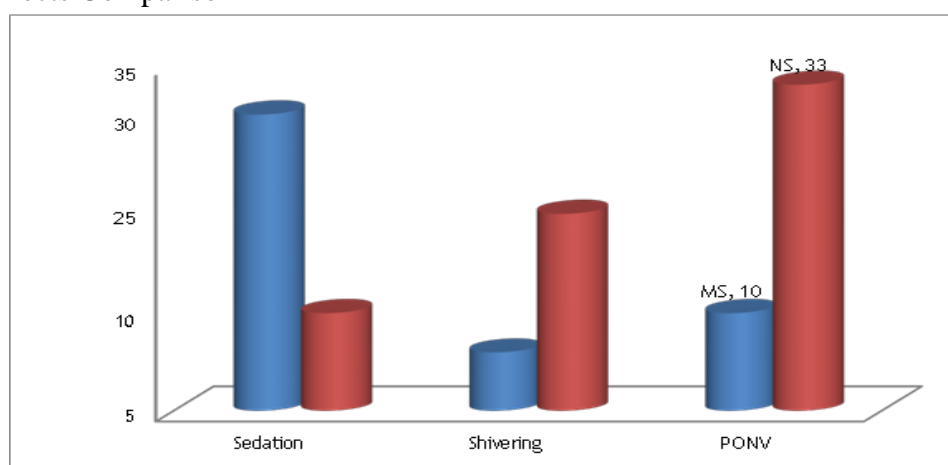
TABLE 7-SIDE EFFECTS OF DRUG AMONG TWO GROUPS

	MS Group	NS Group
Sedation	9/30(30%)	3/30(10%)
Shivering	2/30(6%)	6/30(20%)
PONV	3/30(10%)	10/30(33%)

Magnesium sulphate group has lesser incidence of side effects like shivering and post operative

nausea and vomiting, but more patients experienced sedation than normal saline group

Graph 7-Side Effects Comparison



Discussion

Laparoscopic cholecystectomy is a procedure with many advantages over open cholecystectomy, early postoperative pain still remains the main problem for some patients. Preoperative pain and inflammation worsens the postoperative pain level, probably through sensitization of the central nervous system. In the first 24 hrs, the site of most severe pain is the upper quadrant and port wounds. In 30%-40% of patients, second peak of pain occurs after 24 hrs and is referred to shoulder tip. The nature and mechanisms of pain after laparoscopic cholecystectomy are multifactorial because pain originates from three sources : port wounds, pneumoperitonium (type of gas, pressure, temperature and volume of residual gas) and cholecystectomy site (visceral pain).In some studies, incisional pain predominated over visceral and shoulder tip pain. Pneumoperitonium causes

neuropathic pain by chemical irritation, ischemia and compression. Multimodal analgesic approach is recommended for treatment of post operative pain after laparoscopic cholecystectomy because of enhanced recovery and reduced risk of side effects. Paracetamol and NSAIDs are effective combination for postoperative analgesia following laparoscopic cholecystectomy and strong opioids should better avoided postoperatively. Preemptive analgesia is a method initiated before anaesthetic procedure in order to reduce nociceptive stimulation. One of the intravenous adjuvant has been shown potential is magnesium sulphate with single low dose intravenous injection. Another mechanism of magnesium sulphate is reduction of catecholamines from both adrenergic nerve endings and adrenal gland there by controls cardiovascular response to tracheal intubation and reduces anaesthetic requirement. In view of the

potential advantages of Mgso4 as an Pre emptive analgesic with minimal side effects, the present study was undertaken to analyse the efficiency of Mgso4 to achieve postoperative analgesia. Sixty patients were taken into study with ASA grade I and II scheduled for elective Laparoscopic cholecystectomy. Patients were randomised based on envelope method. Study period was between march 2013 to September 2015. Patients in magnesium group(group MS)received i.v MgSO4 50 mg/kg in 100ml of 0.9% normal saline during Pre induction time and patients in the control group (group T) received 100ml of 0.9% normal saline .GROUP 1: Patients with MgSO4 (MS) GROUP 2: Patients without MgSO4(NS). Analgesic efficacy of Mgso4 on post operative analgesia was measured by Visual Analog Scoring, total amount of rescue analgesic consumption per day, time taken for first dose rescue analgesia. Post operative haemodynamic parameters were also measured. In the present study 60 patients were taken age between 20-50 years of both sexes based on computeraised randomisation, the demographic data with respect to age, sex, weight were comparable in both the groups with P value >0.05 .This data was similar to study done by Hammad Usmani et al who conducted a randomized double blind study with 60 patients of age group 18-50 years who done study to evaluate perioperative magnesium sulphate infusion on postoperative pain in patients undergoing upper abdominal surgery.

Vasscoring: In this study VAS scores were measured for pain scoring which ranges from 0 to 10.The VAS scores measured at 0 hr i.e immediately after extubation and at 2hr,4 hr,8 hr,12 hr in post operative period. There was a highly statistically significant difference among both groups at extubation with a VAS score of 4.6 ± 1.11 in magnesium group and 5.76 ± 1.30 in NS Group. (P value 0.0005).Similarly the P Value was statistically significant (<0.05) at 2hr and 4 hr with mean VAS score being 4.2 ± 1.3 and 3.6 ± 1 in MS Group where compared to a higher VAS score of 5.1 ± 1.01 and 4.13 ± 0.095 in NS Group. The P

value was insignificant at 8 hr and 12 hr in both groups with P value > 0.05.The result being comparable with the study done by Hammad39et al who done study on postoperative pain in patients undergoing upper abdominal surgery , found VAS scores of 4.2-4.7 during 0 - 3hrs postoperatively in MGSO4 group compared with 5.3-6.2 in control group.(P<0.05). The results of Bhatia38 et al. found administration of intraoperative MGSO4 as an adjuvant analgesic in patients undergoing open cholecystectomy resulted in better pain relief and comfort in the first postoperative hour, with better sleep quality during postoperative period, without any significant adverse effects. Benhaj38 Amor M et al. evaluated the effect of intra and postoperative magnesium sulphate infusion on post operative pain in abdominal surgery and the results of the study support the use of magnesium sulphate as useful adjuvant for postoperative analgesia in abdominal surgery. Kiran S33 et al. studied that the administration of intravenous magnesium sulphate 50mg/kg preoperatively significantly reduces postoperative pain in patients undergoing inguinal surgery. They found statistically significantly lower VAS scores in magnesium sulphate group ranging from 1.86 ± 0.70 vs 1.96 ± 0.53 (P value 0.138) at 0 hr and 1.22 ± 0.76 vs 1.82 ± 0.96 at 2 hr (P value 0.001) and 1.32 ± 0.84 vs 1.88 ± 0.44 , 2.74 ± 1.43 vs 3.84 ± 1.46 , 1.36 ± 0.69 vs 2.00 ± 0.76 , 0.78 ± 0.68 vs 1.30 ± 0.46 at 4 hr,8hr,12 hr 24 hr respectively. Study done by Iva Bacak Kocman et al, studied comparison between two doses of 5 mg/kg and 7.5 mg/kg obtained VAS scores were significantly lower in both groups during first post operative period. This was also supported by study done in gynaecology patients by Ryu J H et al who were given magnesium sulphate along with bolus dose and also continuous infusion by 15 mg/kg/hr had better VAS scores in at rest and at movement at 24hr and 48 hr after surgery.

Tramadol Consumption Per Day: Tramadol consumption for pain relief was noted in both the groups for first postoperative day. The tramadol

consumption was higher in NS group (298.33±66.43) than with MS group (248±55.5) with statistically significant P value <0.05. This was supported by study done by Levauxch et al who observed that postoperative opioid consumption and pain scores were lower in the magnesium group, the first night's sleep and global satisfaction scores were better in the magnesium group after major lumbar surgery. Tazuin –Fin P37 et al. study showed that intravenous magnesium sulphate reduces tramadol consumption when used as a postoperative analgesic in radical prostatectomy. Study results are comparable as cumulative mean tramadol dose after 24hr was 226mg in the magnesium group, where as in normal saline group consumption of tramadol was 446 mg with significant P value of 0.001. These results were comparable to study done by Benhaj36 et al, where morphine consumption was significantly higher in control group than MS group on first postoperative day with mean and standard deviation of 52±4 mg and 30±3 mg with significant P value of 0.0002. Hamad Usmani39 et al, also supported the study by evaluation of perioperative Magnesium Sulphate in patients undergoing upper abdominal surgery found that total tramadol consumption was 105±31 mg in normal saline group compared to 80±24 mg in magnesium group, with P value <0.05. O Mentis study was comparable as study results effect of intraoperative infusion of Mgso4 on pain relief after laparoscopic cholecystectomy showed the tramadol consumption in MS Group is 281±34 and in NS group 317.46±129.59, concluded that analgesic consumption was more in normal saline group.

Time for first rescue Analgesia: The patient in MS group received first dose of inj. Tramadol 1mg/kg as rescue analgesia after a mean ± SD of 82.33±22.90 min in post operative period compared to NS group who received tramadol 44.33±22.7min. This is statistically significant with P value of 0.01. Results are comparable with study done by Hammad39 et al who had a mean requirement of first dose of tramadol had a mean

time of 162 in magnesium group compared to NS group. Gautam Piplai²³ et al, in their study the time for first postoperative analgesic requirement was significantly longer in group MS than group NS (P value<0.05). cumulative postoperative opioid consumption was significantly less in group MS at 24 and 48 hr after operation (P<0.024, p<0.007). Benhaj36 et al, had done a study with 48 patients, the time of the first demand of morphine was significantly longer in MS group than in NS group respectively (18±5 min vs 7±1min, p=0.03).

Heart Rate: There was a statistically significant higher in heart rate to MS group at 0 hr and 2 hr with p value of 0.042 and 0.001 respectively. This can be explained by a higher incidence of pain in the NS group compared to MS group. This is consistent with the study done by Gautam Piplai et al who observed higher heart rate in patients given normal saline.

Mean Arterial Pressure: The MAP values were significantly lower in MS group with P value 0.0001 and 0.0002 at 0hr and 2hr respectively, compared to NS group. This can be explained by lesser incidence of pain in MS group and ability of MGSO4 to maintain stable haemodynamics. The observation of Gautam Piplai 32 et al was similar they found significantly higher MAP in normal saline group.

Side Effects: In our study patients receiving magnesium sulphate were found to be more sedated in immediate postoperative period as compared to control group although they are easily arousable. This is expected as magnesium sulphate is regarded as a CNS depressant this was supported by study done by Shashi Kiran³³ et al, showed statistically significant P value 0.00 in MS group than NS group.

Shivering causes discomfort and aggravated by postoperative pain. Therefore prevention of shivering may attenuate postoperative pain and enhance patient satisfaction. Intravenous Mgso4 has been reported suppress post anaesthetic shivering. In our study incidence of shivering was 6% in study group in comparable with control

group 30%. This was supported by study done by Gautam Piplai et al. showed patients in group MS less shivering. In this study postoperative nausea and vomiting was observed in 10% in MS group as compared to 33% in NS group, this was supported by study done by O Mentis²⁴ et al, who concluded that PONV was lower in MS group compared to NS group, though it is statistically not significant. Magnesium concentration in serum and cerebrospinal fluid was not measured in the present study and it was the limitation of the study. It has been studied that most of total magnesium (99%) is intracellular and estimation of plasma magnesium does not represent magnesium content of body tissues. Therefore, there is lack of correlation between plasma magnesium concentration and total body content. It is known that magnesium induce hypotension directly by vasodilatation as well as indirectly by sympathetic blockade and inhibition of catecholamine release. However, we did not observe any hypotensive episode in our patients treated with magnesium sulphate. Transient fall in blood pressure was observed in both the groups which can be attributed to use of propofol as an induction agent. None of our patients had any significant bradycardia that required treatment.

Summary

The present study was conducted in King George hospital, Vishakapatnam, between Nov 2013 to Sept 2015 to evaluate the efficacy of intraoperative MgSO₄ as pre-emptive analgesic on post-operative pain relief in laparoscopic cholecystectomy.

After obtaining approval from the Hospital Ethics committee along with written and informed consent, 60 patients belonging to AS grade I and II patients scheduled for elective laparoscopic cholecystectomy surgery were chosen and patients were divided into two groups of 30 each. Group MS received 50mg/kg MgSO₄ in 100 ml normal saline. Group NS receive plain 100ml normal saline.

Postoperative analgesia was assessed based on visual analog scoring. Post-operative analgesia was more effective in magnesium group than normal saline.

Total tramadol consumption per day was calculated which was more in normal saline than magnesium group.

The time for first dose of rescue analgesia was longer duration in magnesium group than normal saline group.

Post-operative haemodynamic variables like heart rate and MAP was stable in magnesium group in early postoperative hours.

Magnesium sulphate group has lesser incidence of side effects like shivering and post-operative nausea and vomiting, but more patients in magnesium group experienced sedation than normal saline group.

Conclusion

The present study evaluated pre-emptive analgesic efficacy of magnesium sulphate on pain relief after laparoscopic cholecystectomy.

From this present study it was concluded that magnesium sulphate was a good pre-emptive analgesic that has better VAS scores and reduces the postoperative tramadol consumption than normal saline group with minimal side effects.

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