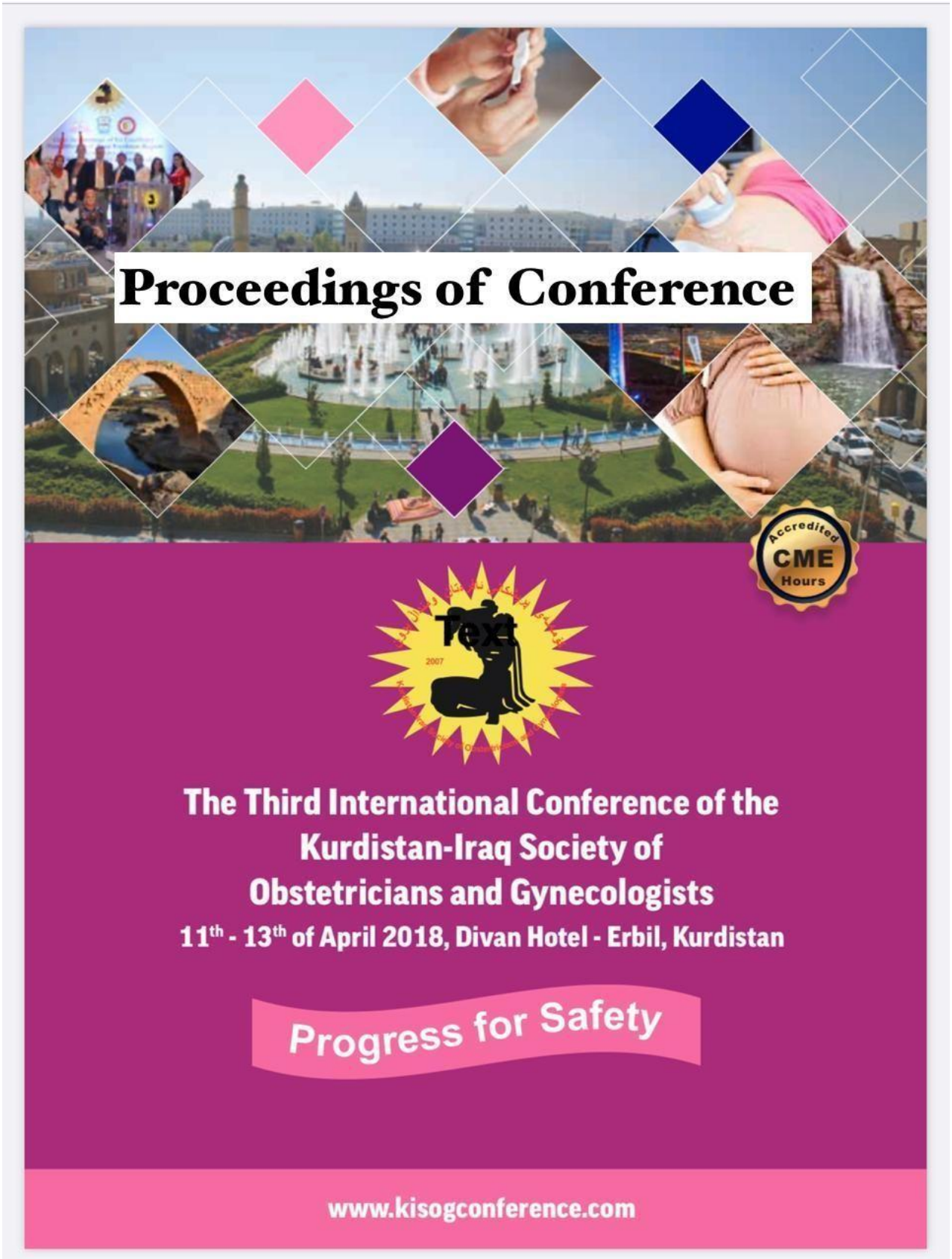
Proceedings of 3rd international conference of Kurdistan-Iraq Society of Obstetricians & Gynecologists

11th -13th of April 2018 , Divan Hotel – Erbil



Www.kisog.net

Intra-incisional injection of magnesium sulfate for post cesarean pain management

Maryam Bakir Mahmood
Obstetrics and Gynecology
Department /lecturer
School of Medicine/University of Sulaimani
Sulaymaniyah/Iraq
Maryam.mahmmod.univsul.edu.iq

Zay Nsaif Jasim
Obstetrics and Gynecology
Department /GP
Sulaimaniyah maternity teaching hospital
Sulaymaniyah/Iraq
zaynsaif@yahoo.com

Abstract

Background and objectives: cesarean section is estimated for about 30% of child births worldwide and it is one of the most common surgical procedures. Pain relief after cesarean delivery is especially important as the consequences of inadequate pain relief are borne not only by the mother but by the newborn as well. Magnesium has been reported to produce important analgesic effects including the potentiation of morphine analgesia, attenuation of morphine tolerance and the suppression of neuropathic pain. **The objectives of this study were** to determine the efficacy of intra-incisional injection of magnesium sulfate for post cesarean pain management as in patient underwent elective cesarean section and the reduced need for extra analgesic use postoperatively**. Methods:** a randomized, placebo controlled, single-blinded study with a total of 200 participants were pregnant scheduled for cesarian section in Sulaimani maternity teaching hospital, from 1 May 2016 to 15 August 2016. Patients were randomly allocated to two the groups, those with odd numbers were assigned to case group (100) received 750mg of magnesium sulfate and patients with even numbers assigned to the placebo group (100) received 20mg of normal saline. **Results*:*** The mean Visual Analogue Score after 4 hours, 8 hours, 12hours and 24hours was significantly less for

the intervention (Magnesium sulfate) group when compared with the control (Normal Saline). **Conclusions.** Subcutaneous administration of magnesium sulfate in post cesarean section pain management can be used as a successful modality or method for pain management.

Keywords: Cesarean section, Pain, Magnesium sulfate

Introduction

Cesarean section is estimated for about 30% of child births worldwide and it is one of the most common surgical procedures[1]. Generally, post-cesarean pains are considered as unpleasant feelings caused by tissue damage and signaling the true or actual injury to the body[2]. Pain following cesarean sections has two main components: somatic and visceral pain.

Cesarean section is estimated for about 30% of child births worldwide and it is one of the most common surgical procedures[1]. Generally, post-cesarean pains are unpleasant feelings caused by tissue damage and signaling the true or actual injury to the body[2]. Pain following cesarean sections has two main components: somatic and visceral pain. Visceral pain is originated from uterine incision and contractions while somatic pain arises from nociceptors within the surgical wound[3, 4]. Pain relief after cesarean delivery is especially important as the consequences of inadequate pain relief are borne not only by the mother but by the newborn as well[3,4,5]. Therefore, effective pain management is critical to promote postpartum recovery and attainment of maternal role and family functioning[6]. The mainstay analgesics in the post-cesarean section period are opioids but are avoided in the parturient since almost all opioids find their way in the milk predisposing the neonate to their adverse effects[7]. So, other modalities for pain relief are often selected. Recently, multimodal approach to pain relief is recommended so that adverse effects of individual drugs can be reduced. NSAIDS, neuraxial blocks, peripheral nerve blocks and local anesthetic infiltration of wound as well as incisional injections have all been used as part of multimodal approach[8,9]. Magnesium has been reported to produce important analgesic effects including the potentiation of morphine analgesia, attenuation of morphine tolerance and the suppression of neuropathic pain[10]. The analgesic properties of magnesium are believed to stem from regulation of calcium influx into the cell and other Magnesium postsynaptic N-methyl D-aspartate (NMDA) calcium channel blocker properties[7,8]. But the exact mechanism of its action is not well understood[11-13].

The aim of study: Measure the efficacy intra-incisional magnesium sulfate in decreasing pain after cesarean section and reduce the extra analgesic use in first 24 hours postoperatively

Patients and methods:

This is a randomized, placebo controlled, single-blinded study carried out in Sulaimani maternity teaching hospital, from 1 May 2016 to 15 August 2016. Total participant were 200 women aged 18 to 40 year old. That admitted to maternity teaching hospital and scheduled for elective caesarian section CS were enrolled. Random allocation was done, Odds number were for the intervention group (n=100) and even number for the control group (n=100). All patients received 75 mg of Lidocaine 5% as a spinal anesthesia.

Intervention group received (750) mg of magnesium sulfate diluted in 20 ml of normal saline and control group received 20mg of normal saline injected intra-incisionally at the end of operation and before closure of the wound and the control group received 2ml of normal saline intra-incisionally. The patients remained blind during the study time. patients with systemic diseases such as heart, kidney, liver, chronic hypertension, mental health problems, pre-eclampsia, opioid dependent patients and patients who were on calcium- channel-blockers, drug allergy and patients with allergy to magnesium sulfate were carefully handled and were excluded in our study. Other exclusions included those who had to be prescribed with magnesium sulfate postoperatively.

General patient characteristics including age, gestational age and indication of cesarean were recorded appropriately in the case sheets. Both groups were followed up for pain score evaluation using Visual Analogue Scale (VAS) list a reference for of score. Intramuscular analgesia was administered every four hours for patients with severe pain (VAS >5) during the first 24 hours of postoperative period.

Statistical Package for Social Sciences (SPSS) version 22, which is a statistical software program, and Microsoft excel spreadsheets (2013) were used for data entry, calculations, and data interpretations. Descriptive statistics and up-to-date statistical methods were used in the evaluations. *P*-values ≤ 0.05 were considered statistically significant.

Results:

The mean age of the patients in intervention group was 26.5 with a standard deviation (SD) of 5.1 years old, and in the control group, the means age was 28.3 with a standard deviation

of 4.9 years old. The Mean duration of operations in the intervention group was 41.1 and a standard deviation of 7.05 minutes, while mean duration of operation in the control group was 43.6 and a standard deviation of 7.3 minutes. There was no statistically significant difference between the two groups regarding patients' characteristics (Table-1).

Table-1: Patient characteristics in both intervention (magnesium sulfate) and control (normal saline) groups.

Characteristics	Magnesium sulfate group (N=100) Mean±SD	Normal Saline group (N=100) Mean±SD	P-value
Age (yrs.)	26.5±5.1	28.3±4.9	0.07
Weight (kg.)	67.2±13.6	65.9±14.1	0.63
Height (cm.)	155.8±7.8	157.3±6.5	0.29
Gravity	2.4±1	2.1±0.95	0.12
Parity	0.93±0.82	0.97±0.86	0.81
Number of cesarean Sections	0.89±0.83	0.91±0.82	0.9
Duration of Operations (mins.)	41.1±7.05	43.6±7.3	0.084

After 4 hours of cesarean sections, the mean Visual Analogue Score (VAS) was 5.8 and a standard deviation of 1.9 for the intervention group, but in the control group, VAS was 9 and a standard deviation of 2.1. As the sense of pain have decreased with time, the mean VAS after 8 hours of operations in the intervention group o was 3 and a standard deviation of 2.2, while the mean VAS and standard deviation in control group after the same time period were 5.7 and 1.5 respectively. After 12 hours, mean and standard deviation in magnesium sulfate group was 2.6 and 1.45, in control group these values were 4.3 and 1.9 respectively. Visual Analogue Scores were all significantly lower in intervention group than control group with the p-values were less than 0.05 as both groups (Table-2).

Table-2: Mean VAS and standard deviation in both magnesium sulfate and normal saline groups in 4 hrs., 8 hrs., 12 hrs., and 24 hrs.

Time and VAS	Magnesium sulfate group (N=100)	Normal Saline group (N=100)	P-value

	Mean±SD	Mean±SD	
After 4 hrs.	5.8±1.9	9±2.1	0.0001*
After 8 hrs.	3±2.2	5.7±1.5	0.0001*
After 12 hrs.	2.6±1.45	4.3±1.9	0.0001*
After 24 hrs.	1.8±1.3	3.8±1.6	0.0001*

(*) significant differences (P-value < 0.05)

Fewer patients in intervention groups needs extra analgesic use (Table-3). No any unwanted side effects were observed in those patients who received medications.

Table-3: The number of cases that needed extra analgesia in both groups.

Cases	Magnesium-sulfate group (N=100) No. , %	Normal-Saline group (N=100) No. , %	P-value
Needed Analgesia	15 , 15 %	96 , 96%	<0.005
Did Not need	85 , 85%	4 , 4%	<0.003
Total	100 , 100%	100 , 100%	

Discussions:

As we compared VAS scores in both groups, it has come to our attention that the sense of pain in the postoperative intervention (magnesium sulfate) group was significantly less as compared to the control group (normal Saline) no matter of the postoperative time. An important part of post-cesarean pain is because of incision in the anterior abdominal wall[14]. Full stop after citation number a variety of local anesthetic techniques have been introduced and implemented for post-cesarean pain management with regard to somatic pain control[15]. Considering the importance of postoperative pain control and fast rehabilitation and recovery after the surgery this study shows the affectivity of magnesium sulfate on decreasing pain in postoperative patients and confirms the efficiency of magnesium sulfate when applied and injected to the skin subcutaneously after wound closure. Other studies also shows the efficacy of magnesium sulfate in post cesarean pain management, a similar study was conducted by Pazoki et al[16]. In their prospective, randomized clinical trial, Pazoki and

colleagues recruited 196 females with elective CS and concluded that incisional injection of magnesium sulfate in post-cesarean section pain management is safe and useful and the mean of VAS score in the magnesium sulfate group was significantly lower than the control group in all the evaluations[16]. Few other studies were conducted to test the efficacy and strength of magnesium sulfate in postoperative pain management after operations such as elective cesarean section and patients with abdominal hysterectomy. These results shares similar characteristics with theirs. Mireskandari[17] in a double blind randomized clinical trial, prior to induction of general anesthesia, randomly assigned fifty elective cesarean candidates in to one of two groups, placebo or magnesium sulfate. After surgery, visual analogue scale (VAS) and infused morphine by patient controlled analgesia (PCA) during 24 hrs were recorded. They found that VAS was significantly lower among patients in the magnesium sulfate group; another randomized clinical trial was conducted by Rezae[18], they randomly assigned and divided seventy pregnant women who underwent elective cesarean section into two groups. The pain scores at rest and upon movement were evaluated up to 24 hrs post operatively. They claimed that post-operative pain scores were significantly lower in magnesium sulfate group ($P < 0.05$).

Conclusions: Magnesium sulfate is a safe and effective drug when it comes to postoperative pain management. Subcutaneous administration of magnesium sulfate in post cesarean section pain management can be used as a successful modality or method. Success and recommendation of incisional administration of magnesium sulfate and its local and systemic side effects depend on conducting further clinical trials and researches in the future.

References

1- Miller RD, Eriksson LI, Fleisher LA, Wiener-Kronish JP, Cohen NH, Young WL. Miller's Anesthesia E-Book. Elsevier Health Sciences; 2014 Oct 20. P3310.
2- Eshkevari L, Trout KK, Damore J. Management of postpartum pain. Journal of midwifery & women's health. 2013 Nov;58(6):622-31.
3- McDonnell NJ, Keating ML, Muchatuta NA, Pavy TJ, Paech MJ. Analgesia after caesarean delivery. Anaesthesia and intensive care. 2009 Jul 1;37(4):539.
4- Kundra S, Singh RM, Singh G, Singh T, Jarewal V, Katyal S. Efficacy of magnesium sulphate as an adjunct to ropivacaine in local infiltration for postoperative pain

following lower segment caesarean section. Journal of clinical and diagnostic research: JCDR. 2016 Apr;10(4):UC18.

5- Hwang JY, Na HS, Jeon YT, Ro YJ, Kim CS, Do SH. IV infusion of magnesium sulphate during spinal anaesthesia improves postoperative analgesia. British journal of anaesthesia. 2009 Nov 19;104(1):89-93.

6- Do SH. Magnesium: a versatile drug for anesthesiologists. Korean journal of anesthesiology. 2013 Jul 1;65(1):4-8.

7- Koinig H, Wallner T, Marhofer P, Andel H, Horauf K, Mayer N. Magnesium sulfate reduces intra-and postoperative analgesic requirements. Anesthesia & Analgesia. 1998 Jul 1;87(1):206-10.

8- Behaeen K, Soltanzadeh M, Nesioonpour S, Ebadi A, Olapour A, Aslani SM. Analgesic effect of low dose subcutaneous ketamine administration before and after cesarean section. Iranian Red Crescent Medical Journal. 2014 Mar;16(3).

9- Verstraete S, de Velde Van M. Post-cesarean section analgesia. Acta Anaesthesiologica Belgica. 2012;63(4):147-67.

10- Albrecht E, Kirkham KR, Liu SS, Brull R. Peri-operative intravenous administration of magnesium sulphate and postoperative pain: a meta-analysis. Anaesthesia. 2013 Jan;68(1):79-90.

11- Seyhan TO, Tugrul M, Sungur MO, Kayacan S, Telci L, Pembeci K, Akpir K. Effects of three different dose regimens of magnesium on propofol requirements, haemodynamic variables and postoperative pain relief in gynaecological surgery. British Journal of Anaesthesia. 2005 Nov 25;96(2):247-52.

12- Taheri A, Haryalchi K, Mansour Ghanaie M, Habibi Arejan N. Effect of low-dose (single-dose) magnesium sulfate on postoperative analgesia in hysterectomy patients receiving balanced general anesthesia. Anesthesiology research and practice. 2015;2015.

13- Bhaskar SB. Case for local infiltration analgesia: Is all the evidence in black and white?. Indian journal of anaesthesia. 2015 Jan;59(1):1.

14- Ryu JH, Kang MH, Park KS, Do SH. Effects of magnesium sulphate on intraoperative anaesthetic requirements and postoperative analgesia in gynaecology patients receiving total intravenous anaesthesia. British journal of anaesthesia. 2008 Jan 1;100(3):397-403.

15- Apfelbaum JL, Chen C, Mehta SS, Gan TJ. Postoperative pain experience: results from a national survey suggest postoperative pain continues to be undermanaged. Anesthesia & Analgesia. 2003 Aug 1;97(2):534-40.

16- Pazoki S, Eraghi MG, Jamilian M. Incisional Injection of Magnesium Sulfate for Post-Cesarean Section Pain Management. Archives of Critical Care Medicine. 2015;1(1).

17- Mireskandari SM, Pestei K, Hajipour A, Jafarzadeh A, Samadi S, Nabavian O. Effects of preoperative magnesium sulphate on post-cesarean pain, a placebo controlled double blind study. Journal of family & reproductive health. 2015 Mar;9(1):29.

18- Rezae M, Naghibi K, Taefnia AM. Effect of pre-emptive magnesium sulfate infusion on the post-operative pain relief after elective cesarean section. Advanced biomedical research. 2014;3.