



Alternative Magnesium Sulphate Regimen for Women with Severe Pre-Eclampsia in Elgadarif Maternity Hospital from January 2016 to January 2017

Dr Fatima .B. A. Basheer¹, Dr Ashwag. A. A .Hamad², Dr Tabareh. S .A .Awadelkrem³

***Correspondence to:** Dr Fatima .B. A. Basheer.

Copyright

© 2024 **Dr Fatima .B. A. Basheer**. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Received: 25 October 2024

Published: 26 November 2024

DOI: <https://doi.org/10.5281/zenodo.14221884>

Introduction

Many women are still dying from complications of pregnancy despite global efforts to reduce the maternal death by 75% by 2015. It was estimated that 287000 women died in 2010, a 47% reduction in maternal mortality rate which is far from the 75% target, Ninety nine percent of these deaths occurred in developing countries , whith sub-sahara A frica alone contributing to 56% (161000 daeths) (1) , the major causes of maternal death remaine the same and they include obstetric hemorrhage , sepsis,

Risk factors

According to Cunningham FG et al (13) , in etiology pf pre=eclampsia include : maternal immunological intolerance , cardiovascular and inflammatory changes , abnormal implantation. In addition, environmental , geneyics and nutritional.

Complications

- Premature birth, low birth weight, or placental abruption
- Fluid in the lungs, heart failure, or bleeding from the liver
- Seizures, stroke, or reversible blindness
- Liver or kidney damage, or low platelet count
- Fetal growth restriction or death of the mother or the baby of Mgso4 in pre-eclampsia

Justification

Study design: Prospective , interventional cross sectional hospital base study

Study area: Algardaref maternity hospital regarded the referral hospital in al gadaref state, with capacity of 200 bed , with average of as 8,894/ year deliveries, eclampsia patients seen are estimated as(5/1,000)

Objectives

To compare the use of mgso4 for 12 hrs versus 24 hrs in women with severe preeclampsia.

Methodology

Study Period : the study was conducted during the period from Jan 2016 to December 2016.

Study Population: all women in Algardarif maternity hospital and diagnosed with severe pre eclampsia during the study period.

Inclusion criteria :

Severe-pre eclampsia

the women who agree to join the study

Exclusion criteria

Women who refused to join the study

Sample size and sampling technique: All patients was diagnosed as sever pre-eclampsia antenatally, intrapartum or post partum with high pressures.

Data variables : demographic characteristics , parity , GA , mode of delivery , magnesium sulfate dose.

Method and data collection :

The data was collected by using a questionnaire from the patients, hospital records or staff interviews. In which the selection of the patient was by randomized selection method included all patient that presented to the labor room , ER and out patient clink . concent was given explaining the method of the treatment either 24 hrs. or 12 hrs.

The patient were admitted in the HDU , catheterized and the mgso4 was given by the rate of 1 g/hr for 24 hr or 12 hrs accordingly by an infusion pump.

Data analysis:

The data was analyzed by computerized program ;statistical package for social sciences (SPSS version 19). result presented in tables and graphs. The test of significance was calculated by P value of (0,05) and 05% confidence interval .

Results

Table (1) Distribution of the women according to age group in Elgadarif hospital received 24 and 12 g of magnesium sulphate

Age group	Maintenance dose of magnesium				P value
	24 g		12 g		
	N	%	N	%	
12-24 years	30	60.0	23	46.0	0.296*
25-34 years	16	32.0	22	44.0	
34-44 years	4	8.0	5	10.0	
Total	50	100.0	50	100.0	

* No significant differences ($P > 0.05$)

Table (2) Distribution of the women according to parity group in Elgadarif hospital received 24 and 12 g of magnesium sulphate

Parity	Maintenance dose of magnesium				P value
	24 g		12 g		
	N	%	N	%	
Primigravida	30	60.0	29	58.0	0.296*
Multipra	11	22.0	18	36.0	
Granmultipra	9	18.0	3	6.0	
Total	50	100.0	50	100.0	

* No significant differences ($P > 0.05$)

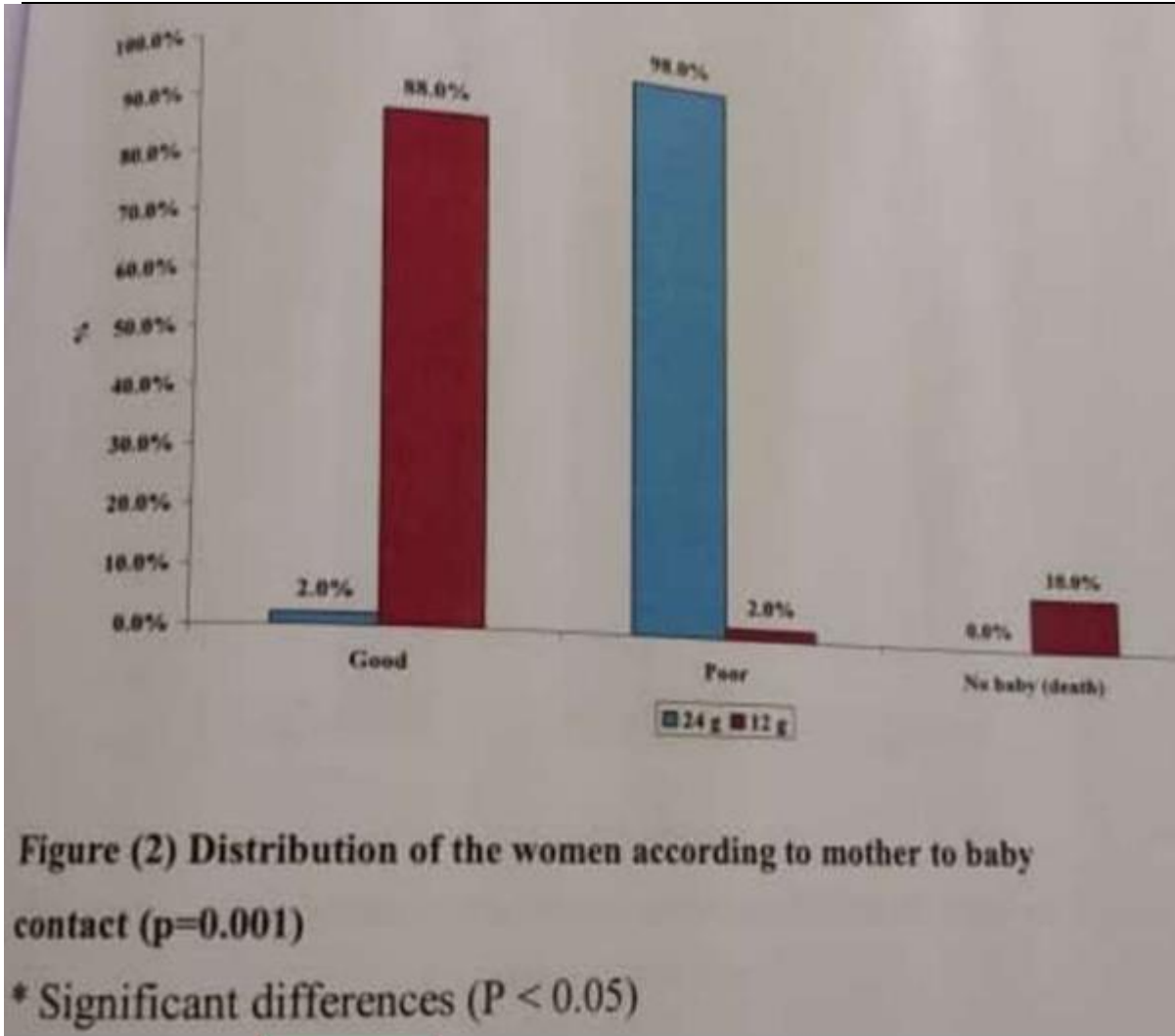


Table (3) Distribution of the women according to ANC in Elgadarif hospital received 24 and 12 g of magnesium sulphate

ANC	Maintenance dose of magnesium				P value
	24 g		12 g		
	N	%	N	%	
Yes	13	26.0	11	22.0	0.166*
No	37	74.0	39	78.0	
Total	50	100.0	50	100.0	

* No significant differences ($P > 0.05$)

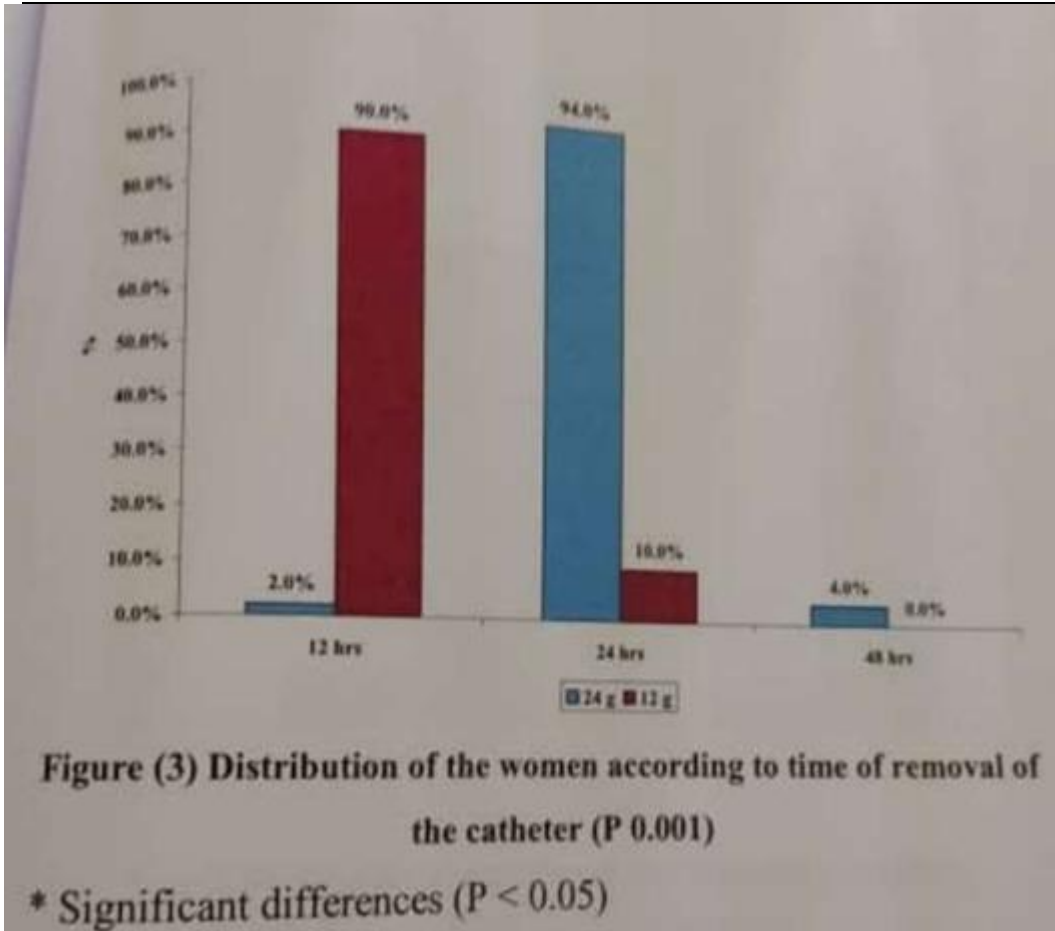


Table (4) Distribution of the women according to seizure at home in Elgadarif hospital received 24 and 12 g of magnesium sulphate

Occurrence	Maintenance dose of magnesium				P value
	24 g		12 g		
	N	%	N	%	
Yes	33	66.0	30	60.0	0.136*
No	17	34.0	20	40.0	
Total	50	100.0	50	100.0	
Number of seizure					
1-2	9	27.3	14	46.7	0.06*
> 2	24	72.7	16	53.3	
Total	33	100.0	30	100.0	
Duration of seizure					
1-2 min	27	81.8	26	86.7	0.237*
> 2 min	6	18.2	4	13.3	
Total	33	100.0	30	100.0	

* No significant differences (P > 0.05)

Table (5) Distribution of the women according to mode of delivery in Elgadarif hospital received 24 and 12 g of magnesium sulphate

Mode of delivery	Maintenance dose of magnesium				P value
	24 g		12 g		
	N	%	N	%	
VD	18	36.0	24	48.0	0.3*
CS	31	62.0	23	46.0	
Instrumental	1	2.0	3	6.0	
Total	50	100.0	50	100.0	

* No significant differences ($P > 0.05$)

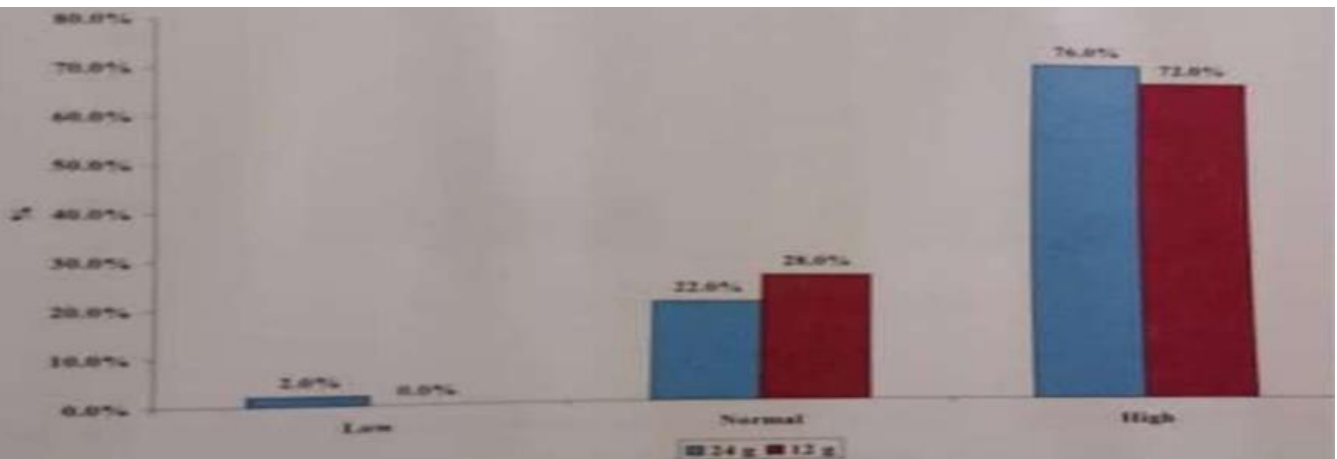


Figure (6) Distribution of the women according to BP at arrival (P value 0.502)

* No significant differences ($P > 0.05$)

Discussion

A systemic review has compared the pregnancy outcome in the case of MgSO₄ presentation in deferent countries and showed that MgSO₄ could reduce the maternal mortality and occurrence of convulsions , repeating convulsions and major morbidities in all of these countries.

In this prospective trial we have found that a12 hrs MgSO₄ in the cases of svere pre eclampsia is associated

with clinical course similar to that of traditional 24 hrs of planned treatment , significantly reducing the duration of MgSO₄ exposure and the need for intensive nursing care.

In the present study , MgSO₄ administration for duration of 12 hrs after delivery was effective in preventing convulsions in 49 women with severe preeclampsia except one. Shorting of the duration of MgSO₄ prescription after delivery in cases of severe pre eclampsia and eclampsia can reduce the risk of magnesium sulfate toxicity and it is adverse effect and as well it is economically beneficial specially in developing countries.

Therefore, it seem necessary to perform studies for the finding mimum duration and dosage of MgSO₄ in order to prevent convulsions after delivery .

Using various regimen of MgSO₄, prescription has been studied during past year ; however up to now there is no consensus on optimal duration of administration after delivery and changing the present policy from 24 hrs to 12 hrs

In 2006 two methods of 12 hrs VS 24 hrs admenstration of MgSO₄ after delivery were compaired in cases with mild pre eclampsia and no cases of serious complication was reported in the 12 hrs group (68)

•Also in another study (70) , using MgSO₄ for 12 hrs after delivery in cases of stable severe preeclampsia was evaluated and was compaired with standered metod of 42 hrs duration . Clinical outcomes were similer between the two groups of 12 hrs and 24 hrs .

•No cases of eclampsia were reported and there was no necessary to restart MgSO₄ but In three patint sout of 60 patients there was necessary to administer MgSO₄ FOR 24 HR S

•In the present study , one of 50 patients had convulsion and we continue the MgSO₄ for another 24 hrs according to the MgO₄ intrnatunal protocol (continue for 24 hrs after delivery or the convulsion whatever the last) but at the same time 49 women have no serious complications compaired with whome recived 24 hrs MgSO₄ .

• Notice that this number of convulsion can occure in the 24 hrs duration of MgSO₄ as well .

With respect to the previous studies , and paucity of researches about the MgSO₄ administration after delivery in the caese of severe pre eclampsia , it seem necessary to perform mor studies in order to find exact criteria to differentiate which patient need 24 hrs duration of MgSO₄ administration and in whc=ich cases there is no need to continue

Also it has to be studies that for which group of patients it is harmful to discontinue Mgso₄ in shorter duration The sample size is small to make a definite conclusion about safty of discontinuing MgSO₄ at 12 therefore

more studies with bigger sample size should be performed in order to reach definite conclusion

Conclusion

Abbreviated MgSO₄ in patient with severe pre eclampsia was associated with less drug exposure, similar outcome, and benefits such as reduction in the time that the mother can start to handle her baby, decrease time of HDU admission and monitoring as well as decrease the staff exhaustion, insure early mobilization and removal of the catheter and decrease time and cost for hospital stay

Recommendations

1. Further studies are needed to establish this regimen to be safely conducted in the hospitals.
2. MgSO₄ it could be the leading cause of death in some cases specially in developing countries so more studies regarding the ways that can decrease its complication should be performed.

References

- 1, WHO. Trends in maternal mortality 1990-2010. WHO, UNICEF. UNFPA and World Bank, WHO, 2012, Geneva Switzerland
2. WHO. The world health report; make every mother and child safe 2015. WHO, Geneva.
- 3, Khan, K. S., Wojdyla, D., Say, L, Galmezoglu, A. M., and Paul Van Look, F. A.: who analysis of causes of maternal death: a systematic review
4. NgocTNN, Merialdi M, Abdel-Aleem H, Carroli G, Purwar M, Zavaleta Net al. Causes of stillbirths and early neonatal deaths; data from 7993 pregnancies in six developing countries. Bull. W.H.O. September 2016; 84 (9).
5. Sibai BM. Diagnosis and management of gestational hypertension and preeclampsia. *Obstet Gynecol.* Jul 2013; 102(1):181-92.
6. WHO, 2004. Bethesda, MD. Global Burden of Disease for the Year 2001 by World Bank Region, for Use in Disease Control Priorities in Developing Countries, National Institutes of Health: WHO
7. Cooray SD, Edmonds SM, Tong S, Samarasekera SP, Whitehead CL. Characterization of symptoms immediately preceding eclampsia. *Obstet Gynecol.* Nov 2011; 118(5):995-9
8. Sibai BM. Diagnosis, controversies, and management of the syndrome of hemolysis, elevated liver enzymes, and low platelet count. *Obstet Gynecol.* May 2004; 103(5 Pt 1):981-91.

9. Silasi M, Cohen B, Karumanchi AS, Rana S. Abnormal placentation, angiogenic factors, and the pathogenesis of preeclampsia. *Obstet Gynecol Clin North Am.* 2010; 37:239-253
- 29 Hallak M, Berman RF, Irtenskauf SM, Janusz. C, Cotton DB Magnesium sulfate treatment decreases N-methyl-D-aspartate receptor binding in the rat brain: An autoradiographic study. *J Soe Gynecol Invest*, 2014; 1: 25-30:
- 30.Ramanathan J, Sibai BM, Pillai R, Angel 11. Neuromuscular transmission studies in preeclamptic women receiving magnesium sulfate. *Am J Obstet Gynecol.* 2010; 158: 40-46.
31. Sibai BM, Spinnato JA, Watson DL, Lewis JA, Anderson GD. Effect of magnesium sulfate on electroencephalographic finding in preeclampsia-eclampsia. *Obstet Gynecol.* 2004; 64: 261-266.
- 32.Sibai BM. Magnesium sulfate prophylaxis in preeclampsia: Lessons learned from recent trials. *Am J Obstet Gynecol.* Jun 2004; 190(6):1520-6
- 33.The Eclampsia Trial Collaborative Group. Which anti...
- 38.The Eclampsia Trial Collaborative Group. Which anticonvulsant for women with eclampsia? Evidence from the collaborative eclampsia trial. *Lancet.* 2005; 345: 1455-1463.
- 39 Hallak M, Cotton DB. Transfer of maternally administered magnesium sulfate into the fetal compartment of the rat: assessment of amniotic fluid, blood, and brain concentrations. *Am J Obstet Gynecol* 1993 Aug; 169(2 PL 1):427-31
- 40.Dangman BC, Rosen TS. Magnesium levels in infants of mothers treated with MgSO₄, *Pediatr Res* 2011; 11:415
41. Widowson E.M.,Mecance R.A The metabolism of calcium, phosphorus, magnesium and strontium *Pediatr.Clin. N.Amer.* 12:595,
42. Lipsitz P.J. and English I.C.:Hypermagnesemia in the newborn infant. *Pediatrics* 2013; 40:856.
- 43.Pruett KM, Kirshon B, Cotton DB, Adam K, Do...
- [9:34 am, 20/11/2024] Fatima: 48. Donovan EF, Tsang RC, Steichen JJ, Strub RJ, Chen IW, Chen M. Neonatal hypermagnesemia; effect on parathyroid hormone and calcium homeostasis. *J Pediatr* 2010;96:305-10
- 49 Mina Abbassi-Ghanavati, James M. Alexander, Donald D. Mentirel, Rashmin C. Savani, Kenneth J. Leveno. Neonatal Effects of Magnesium Sulfate Given to the Mother *Amer J Perinatol* 2012; 29(10): 795-800.
- 50.Green KW, Key TC, Coen R, Resnik R. The effects of maternally administered magnesium sulfate on the neonate, *Am J Obstet Gynecol* 2013;146:2933

51. Heinonen OP, Slone D, Shapiro S. Birth Defects and Drugs in Pregnancy, Littleton, MA: Publishing Sciences Group, 2007:440
52. Stone SR, Pritchard JA. Effect of maternally administered magnesium sulfate on the neonate. *Obstet Gynecol* 2010; 35:5747
53. weakness by gentamicin, amikacin. *J Pediatr* 2013; 102:62931. tobramycin, and
58. Bansal. Y. Preeclampsia/ eclampsia; a profile from Pumwani Maternity Hospital Kenya East Afr. *Med J* 2005; 62(10):691-8.
59. Niraj N, Mahajan, Anita Thomas, Rajani N, Soni, Nilima L., Gaikwad, Suchi M. Jain, Padhar Regime' - A low dose magnesium sulfate treatment for eclampsia. *Gynecol Obstet Invest* 2009;67:2024,
60. Joshi Suyajna D and Veerendrakumar CM. Single dose MgSO₄ for eclampsia-A safe motherhood initiative: *Journal of clinical and diagnostic research* 2013; v.7(5): 128-132.
61. Jack A. Pritchard, Cunningham G et al. The Parkland Memorial Hospital Protocol for treatment of eclampsia: Evaluation of 245 cases. *Am.J.ObstetGynaecol* 1984;148:951-63
62. Gordon R, Magee LA, Pay...
67. Sibai BM. Magnesium sulfate prophylaxis in preeclampsia: lessons learned from recent trials *Am J Obstet Gynecol* 2004;190:1520-6.
68. Ehrenberg HM, Mercer BM. Abbreviated postpartum magnesium sulfate therapy for women with mild preeclampsia: a randomized controlled trial. *Obstet Gynecol* 2006;108:833-8.
69. Damgawn L, Jose R, Regi A, et al. A shortened postpartum magnesium sulfate prophylaxis regime in pre-eclamptic women at low risk of eclampsia. *Int J Gynecol Obstet* 2012;116:237-9.
70. Leal NV, Amorim MM, Franca-Neto AH, et al. 12-Hour compared with 24-hour postpartum magnesium sulfate therapy in preeclampsia: a randomized clinical trial. *Obstet Gynecol* 2014;123:64S.
71. Maia SB, Katz L, Neto CN, et al. Abbreviated (12-hour) versus traditional (24-hour) postpartum magnesium sulfate therapy in preeclampsia a randomized clinical trial. *Obstet Gynecol* 2014; 123: 64s.



Medtronic