ORIGINAL RESEARCH PAPER

Volume-8 | Issue-1 | January-2019 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

EFFECT OF MAGNESIUM ON NEONATES OF MOTHER GIVEN MGSO4 FOR PIH

Gynecology

Atin Halder Associate Professor , Department of Gynaecology and Obstetrics, Burdwan Medical College , Burdwan.

Santanu Adikari* Junior resident , Department of Gynaecology and Obstetrics , Burdwan Medical College , Burdwan. *Corresponding Author

Ankit Halder Junior resident , Department of Gynaecology and Obstetrics, KPC Medical College , Jadavpur, Kolkata.

ABSTRACT

Preeclampsia is a hypertensive, multi-system disorder of pregnancy that significantly contributes to maternal and fetal/neonatal morbidity and mortality. It is found that Mgnesium sulfate injection is associated with lower apgar score and poor muscle tone. There are some confounding factors as meconium stained, birth asphyxia . Thus to ascertain whether poor muscle tone and poor APGAR score is solely due to Magnesium or other reasons, we have done the study.

KEYWORDS

Mgnesium sulfate, apgar score , neonates, muscle tone

INTRODUCTION:

Preeclampsia is a hypertensive, multi-system disorder of pregnancy that significantly contributes to maternal and fetal/neonatal morbidity and mortality[1,2] . As for pharmacologic management, magnesium sulfate is administered during labor, delivery, and postpartum to prevent convulsions in women with PIH

we here to study different aspect of disease progression, various treatment modalities specially magnesium sulphate and its impact on mother and also new born.

MATERIALS AND METHODS:

This prospective case control study was undertaken in the department of obstetrics and gynecology at Burdwan Medical college, from 1st July, 2015 to 30th June 2016. Total 100 mothers participated in the study . All term neonates of mother who have received at least 6hr of MgSO4 were included . Demographically matched term neonates of mother who have not received MgSO4 and delivered just after consider as case.

All preterm mothers and neonates , congenitally anomalous neonates including CVS,CNS,muscular or peripheral nervous system abnormality, motherr eceived opioids or sedatives regularly , Neonates had brain trauma during intrapartum period and any metabolic disorder or hypothyroidism were excluded.

Maternal blood magnesium level at the time of delivery. Time interval between initiation of MgSO4 therapy and delivery. Time interval between onset of convulsion and delivery.

Neonatal cord blood magnesium level at the time of delivery. Neonatal Apgar score at 1 min and five minutes and follow up till discharge. The nursery course, feeding patterns, time to first stool and first void to be recorded and whether respiratory depression or decreased tone were found to the baby.

Study Group: 50 pair of term pregnant mother and baby receiving MgSo[4] .

Control group: 50 pair of term pregnant mother and baby Comparison of all variables will be done by using mean+/- SD, student t-test,chi-square test and other relevant statistical analysis by SPSS 20.p-value of <0.05 will be considered significant.

Results

Tab1 : Distribution According To Hours Of Mgso4 Injection Before Delivery

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Mgso4 <= 6 hrs	19	14	19	16.95	2.483
Mgso4 > 6 - &l < 12 hrs	21	10	24	19.81	4.864
Mgso4 > = 12 hrs	10	29	29	29.00	<0.001
Total Mgso4 doses(grm)	50	10	29	20.56	5.636

Tab 4: Disribution According To Avge. Apgar Score At 5 Minunte In Respect Of Hours Of Magnessium Injection

	Time of Mgso4				
	<= 6 hrs	> 6 &< 12 hrs	> = 12 hrs		
	Mean ± Std. Deviation	Mean ± Std. Deviation	Mean ± Std. Deviation	p Value	Significance
APGAR 5M	5.68 ± 2.73	6.14 ± 1.82	6.7 ± 1.34	0.479	Not Significant

Table 5: Disribution According To Avge. Muscle Tone At 1 Min And5 Minunte In Respect Of Hours Of Magnessium Injection

Time of Mgso4		MUSCLE TONE 5M	MUSCLE TONE 1M
<= 6 hrs	Mean	0.74	0.95
	Std. Deviation	0.87	0.85
> 6 & < 12 hrs	Mean	1.10	1.38
	Std. Deviation	0.94	0.86
> = 12 hrs	Mean	1.30	1.60
	Std. Deviation	1.34	1.07
	p Value	0.314	0.142
	Significance	Not Significant	Not Significant

Tab 6:disribution According To Cord Blood Mean Magnessium Lavel In Respect Of Hours Of Magnessium Injection

	Time of Mgso4				
	<= 6 hrs	> 6 &< 12 hrs	> = 12 hrs		
	Mean ± Std. Deviation	Mean ± Std. Deviation	Mean ± Std. Deviation	p Value	Significance
Cord Blood Mg++ (mg/dl)	3.23 ± 0.26	3.65 ± 1.00	7.63 ± 1.02	<0.001	Significant

Table -1 showing 3.46mg/dl,3.94mg/dl and 8.01mg/dl in respectively when we are giving MgSO4 <6hrs,6-12hrs and >12hrs before delivery.here p value is 0.000 and it is significant.

Table -2 depicted serum mean magnesium level incase group is 4.57 mg/dl and in control group it is 2.21 mg/dl. statistically significant.

In table 3, APGAR score changing in respect of hrs of MgSO4 injection before delivery expressed . Mean APGAR score were

4.58,5.57 and 5.6 when we are giving MgSO4 <6hrs , 6-12hrs and >12hrs before delivery respectively. And no statistical significance found .So in my study mean MgSO4 injection makes no deference in APGAR score (Table - 3). Table **-4** describing APGAR score at 5 min changing in respect of hrs of MgSO4 injection before delivery.Mean APGAR score were 5.68,6.14 and 6.7 in respect ofwhen we are giving MgSO4 <6hrs,6-12hrs and >12hrs before delivery. And no statistical significance found.

We have found ,mother who have given MgSO4 for <=6hrs,of those baby mean muscle tone at 1min was 0.74 and SD 0.87 . Those mother given MgSO4 for >6hrs-<12hrs,>12hrs mean muscle tone at 1 min was 1.10(SD0.94) and 1.30(SD 1.34) respectively (Table-5).

We have also shown muscle tone at 5 min.Though mean APGAR score was low than control but significant difference were not found in respect of hrs of magnesium injection.

We have found mother who have given MgSO4 for <6hrs,>6-<12hrs and >12hrs,cord blood Mg++ level was 3.23mg/dl(SD 0.26), 3.65mg/dl(SD 1.00) and 7.63mg/dl (SD 1.02) (Table-6).

Discussions

Preeclampsia is considered an idiopathic multisystem disorder that is specific to pregnancy. Several potential biochemical markers have been proposed to predict the severity of preeclampsia. The multi organ dysfunction in preeclampsia caused by vascular endothelial damage, including maternal liver, kidney, lungs, nervous system, coagulation system leads to excessive LDH leakage and elevated levels in serum .
We have alsofound >40wks of gestation is associated with more chance of having PIH. Clinical Evaluation of Hypertension and Proteinuria in patients who developed preeclampsia. [3].

Preeclamsia also associated with low birth weight and IUGR. 72% baby found to be low birthweight in case of eclampsia and PET vs 18% in control group.This observation supported by other study also [4].
Magnesiun sulfate injected to those mother who are pleeeclamptic and eclamptic. We have divided those into 3 categories according to hours of injection before delivery. Who were given injection over <6 hrs mean MgSO4 given was 16.95grm(SD =2.483), who ere given 6-12 hrs mean MgSO4 dose were 19.81gm(SD =4.864),and who were given >12hrs mean dose were 29.00gm(SD <0.001**) .** Rise of magnesium level was dose related.Serum magnesium level in case of injection given <6hrs, 6-12 hrs,>12 hrs was 3.46mg/dl,3.94mg/dl and 8.01 mg/dl respectively.

Study reported [4] that the mean maternal serum magnesium level was 2.3 mmol/L for patients received 8 g magnesium sulfate, and 3.46 mmol/L for patients received > 8 g magnesium sulfate (difference of means 1.16, 95% confidence interval 1.08 to1.38]. The mean cord blood magnesium level was 2.2 mmol/L and 3.36 mmol/L, for the groups respectively (difference of means 1.16, 95% confidence interval 1.08 to1.38]. Cord blood magnesium level was found to increase significantly with increase in maternal serum magnesium level (at the time of delivery), ($R = 1.000$, $P = 0.000$) .

As far as neonatal complication is concerned, 22% was birth asphyxia,8% was IUFD,and 30% was meconium stained. Smilar finding were found in a study by M Das et al [4] Cord blood magnesium level was 4.29±1.87 mg/dl in case and control was 2.05±0.29 mg/dl. Similarity was found in the study by Riaz M et al [5]Rise of magnesium level was dose responsive. Mother who have given MgSO4 for <6hrs, >6 - <12hrs and >12hrs ,cord blood Mg++ level was 3.23mg/dl(SD =0.26),3.65mg/dyl(SD =1.00) and 7.63mg/dl(SD =1.02**).**

Cord blood calcium level was with in normal range**. This** finding also corroborated by other authors . [5,6]

Cord blood magnesium level was 80–96% of maternal serum magnesium level. Similar results have been reported by other studies [7.]
As far as NICU admission is concerned, in my study 52 % in case compared to only 24% in control group admitted in NICU. Similar finding was found by M Das et al.[4]

Majority neonate have suffered from hypotonia and low APGAR score. Those finding was also found in study by others [5,8,9,.] Muscle tone was not different in respect to hours of magnesium injection. This findigs also supported [8.] But AFGAR score difference and muscle tone difference not significantly changed in respect to hrs of magnesium injection.

Conclusion :

It is found that Mgnesium sulfate injection is associated with lower apgar score and poor muscle tone. There are some confounding factors as meconium stained, birth asphyxia babies usually have low apgar score. Also due to pathophysiological changes of placenta, baby born to eclampsia and preeclampsia mother are in majority IUGR baby and consequently have poor muscle tone and poor APGAR score. Thus to ascertain whether poor muscle tone and poor APGAR score is solely due to Magnesium or other reasons, further studies about dose of MgSO4 and pathophysiological aspect of PIH are required.

We also found that those who were given MgSO4 over>12 hrs Mg^{++} level was 8.01 ± 0.93 mg/dl.That is much high normal range. So also toxicity may occur after more use.

So we must think of much close monitoring by regular serum Mg++ assessment atleast after 12 hrs/3 MgSO4 doses.

To avoid magnesium toxicity clinical assessment to be done.To establish this further study to be done.

So we must think of close monitoring by regular serum Mg++ assessment atleast after 12 hrs/3 MgSO4 doses or else opt for low dose MgSO4 may be prepared.

Neurological assessment of the baby in neonatal period was found to have hypotonia but assessment of long term effect on neurodevelopment to be further studied.

REFERENCES

1. American College of Obstetricians and Gynecologists. ACOG practice bulletin: Diagnosis and management of preeclampsia and eclampsia. Number 33, January 2002. Obstetrics & Gynecology. 2002;99(1):159–167. [PubMed
2. National Heart, Lung, and Blood Institute National High Blood Pressure Education Program. Report of the national high blood pressure education program working group on high blood pressure in pregnancy. American Journal of Obstetrics and Gynecology. 2000;183(1):S1–S22.
3. The Inernet Journal of Gynecology and Obstetrics. Clinical Evaluation of Hypertension and Proteinuria in patients who developed preeclampsia.2005; 5.
4. Das Monalisa ,Ray Chaudhuri Patralekha , Mondal Badal C. , Mitra Sukumar , Bandyopadhyay Debasmita , and Pramanik Sushobhan: Assessment of serum magnesium levels and its outcome in neonates of eclamptic mothers treated with low-dose magnesium sulfate regimen.Indian J Pharmacol. 2015 Sep-Oct; 47(5): 502–508
5. Riaz M, Porat R, Brodsky NL, Hurt H. The effects of maternal magnesium sulfate treatment on newborns: A prospective controlled study. J Perinatol. 1998;18:449–54.
6. Chesley LC. New York: Appleton-Century-Crofts; 1978. Hypertensive Disorders in
7. Green KW, Key TC, Coen R, Resnik R. The effects of maternally administered magnesium sulfate on the neonate. Am J Obstet Gynecol. 1983;146:29-33.
8. Lipsitz PJ. The clinical and biochemical effects of excess magnesium in the newborn. Pediatrics.1971;47:501–9.