DIFFERENT REGIMENS OF MAGNESIUM SULFATE AND IT'S ROLE IN MANAGEMENT OF WOMEN WITH SEVERE PRE-ECLAMPSIA

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Abstract

Background: Preeclampsia constitutes a serious problem with high incidence that faces the workers in the field of obstetrics and needs good diagnosis and management and must not be neglected as maternal and fetal morbidity and mortality are so dangerous.

Aim of the work: To different Regimens Of Magnesium Sulfate And It's Role In Management Of Women With Severe Pre-Eclampsia

Patients and methods: A randomized controlled study that compared three regimens for administration of MgSO₄ used for the cases of severe pre-eclampsia that was performed in the Obstetrics & Gynecology Department, Agouza police Hospital during the period from decemeber 2018 to the end of August 2019

Results: 240 patients were recruited for our study based on their presentation which was severe preeclampsia.

Mean age of patients was; 26.65 years, SD 5.113 (range;16-42).

Mean gestational age was; 35.75 weeks, SD 2.769 (range;28-40).

Mean systolic BP was; 161.88mmHg, SD 17.121 (range;100-210).

Mean diastolic BP was; 103.15, SD 12.127 (range;50-120).

Conclusion: The use of loading dose only of MgSO₄ in the ante-partum period with no post partum maintenance doses. If complications occurred, we recommend the abbreviated regimen as an alternative to the standard regimen.

Introduction:

Preeclampsia is a multisystem disorder of pregnancy which is a major cause of maternal and fetal morbidity and mortality worldwide. The cardinal clinical features of the condition are hypertension and proteinuria occurring after 20 weeks gestation in women who were not previously known to be hypertensive. **(1)**

Pre-eclampsia often affects young and nulliparous women, whereas older women are at great risk of chronic hypertension with superimposed preeclampsia. **(2)**

Preeclampsia is considered severe if one or more of the following:

(1) Blood pressure of 160 mmHg systolic or higher or 110 mmHg diastolic or higher on two occasions at least 6 hours a part while the patient on bed rest.

(2) Proteinuria of 2 gm. or high in 24 hours urine specimen or +2 or great on two random urine samples collected at least 4 hours apart.

(3) Oliguria of less than 500 ml in 24 hours.

(4) Cerebral or visual disturbance.

(5) Pulmonary edema or cyanosis.

(6) Epigastric or right upper quadrant pain.

In normal pregnancy the spiral arteries in the placental bed are invaded by trophoblast, which becomes incorporated into the vessel wall and replaces the endothelium, muscular layer and neural tissue. These physiological changes convert the spiral arteries from narrow muscular vessels to wide non-muscular channels independent of maternal vasomotor control. Pre-eclampsia is thought to be the consequence of impaired trophoblastic invasion of the maternal spiral arteries. **(4)**

Magnesium sulfate is widely used in obstetrics and is a drug of choice in two important complications of pregnancy, preeclampsia and preterm labor . Magnesium sulfate, is used to prevent seizures in preeclampsia patients. **(5)**

The most common side effect is flushing. Others are far less common and include nausea, vomiting, muscle weakness, thirst, headache, drowsiness and confusion. Although magnesium sulphate can lead to respiratory depression and respiratory arrest, these hazards appear to be rare. Higher dose regimens may be associated with a great risk of side effects and adverse effects. If magnesium sulphate toxicity does occur, intravenous calcium gluconate is an effective antidote.(6)

Aim of the work: In our study we tried to assess the comparative effects of three regimens for the administration of magnesium sulfate when used for the care of women with severe pre-eclampsia.

Patients and methods:

We were planning a study of independent cases and controls with 1 control per case. Prior data indicated that the failure rate among controls is 0. If the true failure rate for experimental subjects is 0.1, we needed to study 73 subjects in both experimental groups and 73 control subjects to be able to reject the null hypothesis. Finally we studied 80 subjects in each arm to compensate for drop out cases so we needed a total of 240 cases of severe pre-eclampsia.

The study included 240 pregnant women presenting to the casualty unit diagnosed as a case of preeclampsia with criteria of severity in the form of one or more of the following:-

- Systolic blood pressure ≥ 160 . •
- Diastolic blood pressure ≥ 110 . •
- Proteinuria $> +2$ by dip stick. •
- Presence of alarming symptoms (headache, visual disturbance, •

epigastric pain, vaginal bleeding).

Fetal growth restriction (IUGR)

Technique of Blood Pressure Measurement:

For the measurement of maternal blood pressure, a mercury sphygmomanometer was used, with a cuff of 20 x 60 cm.

The initial measurement for the diagnosis of severe preeclampsia was performed while the patient was being seated, holding her right arm at heart level, being considered the last value obtained.

After loading dose of magnesium sulfate, new blood pressure measurement was performed. Diastolic pressure was determined by Korotkoff phase V. All

measurements were performed by the same researcher.

Statistical analysis

Data were statistically described in terms of mean standard deviation (SD), median and range, or frequencies (number of cases) and percentages when appropriate. Comparison of numerical variables between the study groups was done using one way analysis of variance (ANOVA) test. For comparing categorical data, Chi square (2) test was performed. Exact test was used instead when the expected frequency is less than 5. *p* values less than 0.05 was considered statistically significant.

All statistical calculations were done using computer program SPSS (Statistical Package for the Social Science; SPSS Inc., Chicago, IL, USA) release 15 for Microsoft Windows (2006).

Results

There was no significant difference between occurrence of eclampsia in the three groups after either administration of loading dose of MgSO₄ only or administration of loading dose with maintenance dose for 12 hours or 24 hours in the studied patients (table 1)

Table 1: Comparison between perinatal mortality in the outcome of pregnancy in the studied groups after administration of MgSO₄.

			Group			Total
			A	B	C	
eclampsia	no	Count	80	79	80	239
		% within Group	100.0%	98.8%	100.0%	99.6%
	yes	Count	0	1	0	1
		% within Group	0.0%	1.3%	0.0%	0.4%
Total		Count	80	80	80	240
		% within Group	100.0%	100.0%	100.0%	100.0%

NB: most cases of IUFD were due to accidental hemorrhage

Fig.1: Comparison between perinatal mortality in the outcome of pregnancy in the studied groups after administration of MgSO₄.

Discussion

Preeclampsia is a major cause of perinatal and maternal morbidity and mortality, which affects 2-5% of pregnancies (7). Management of pre-eclampsia is based on stabilization, continued monitoring and delivery at an optimal time for mother and her baby. There is strong evidence from many randomized trials that supports the use of magnesium sulfate for the prevention and treatment of women with eclampsia (8).

The incidence of seizures in untreated pre-eclamptic women is approximately 3-4%, whilst for those receiving magnesium sulfate; the rate is 0.8-1% (9).

There is little reliable evidence from randomized trials assessing the minimum effective dose, the comparative effects of alternative routes of administration (intravenous or intramuscular), or the ideal duration of therapy (9).

In our study we tried to compare three regimens of administration of Magnesium Sulfate where 240 patients were recruited and divided into three groups. Each group contains 80 patients, the first group received only the loading dose of MgSO₄ and the second group received loading dose plus 12 hours maintenance dose while the last group received the loading dose and the full maintenance dose of MgSO₄ for 24 hours.

We found that there was no significant difference between occurrence of eclampsia, HELLP syndrome, maternal side effects or prematurity & perinatal mortality and neonatal ICU admission in the three groups after either administration of loading dose of MgSO₄ only or administration of loading dose with maintenance dose for 12 hours or 24 hours in the studied patients.

However, there was a significant difference between maternal ICU admissions in the three groups (Group A, B & C) with highest rate in Group C and lowest rate in Group A.

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