Original Article

Effect of single loading dose of MgSO4 in severe PIH

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Abstract

Aims and Objective: To evaluate the effect of single loading dose of mgso4 in severe preeclampsia. To evaluate the foeto maternal outcome in patients with severe preeclampsia. **Material and Methods:** The study will be conducted at the Department of Obstetrics and Gynaecology, Pannadhay Rajkiya Mahila Chikitsalaya, RNT Medical College, Udaipur. One group of 50 women received only loading dose of mgso4. Another group of 50women were given complete standard regime according to the Pritchard regime i.e. 14gm loading dose followed by maintenance dose. Number of fits was observed after mgso4 given. Side effect due to drug like vomiting, headache, pain or abscess at site of injection was observed. Serious side effects including respiratory distress, renal failure, cardiac arrest and immediate neonatal outcome was also observed. **Results:** There were total of 100patients of severe PIH in study were randomized to receive either standard Pritchard regime or loading dose only. The profile of patients between case and control were comparable. The number of convulsion were 5in case and 4 in control group not significantly different. Pvalue-0.727. The disease severity indicators serum uric acid and LFT between two groups were also comparable. The rate of caesarean delivery was 50.0%in case and 30.0%in control group. There were also no significant difference in foetal outcome. **Conclusion:** The study suggested that only loading dose of mgso4 is as effective as standard regime in controlling convulsion in severe PIH. The number of fits was comparable in both groups. It reduces painful repeated I.M. injections and infection at injection site and also reduce the maternal and foetal toxicity due to higher dose of mgso4..

Keywords: MgSO4, PIH.

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INTRODUCTION

Normal pregnancy is characterised by a fall in blood pressure, detectable in the first trimester and usually reaching a nadir in the second trimester. Blood pressure rises towards pre-conception levels towards the end of the third trimester.

Hypertension in pregnancy is defined as:

- Systolic blood pressure greater than or equal to 140 mmHg and/or
- Diastolic blood pressure greater than or equal to 90 mmHg.

Detecting a rise in blood pressure from preconception blood pressure (> 30/15 mmHg), rather than relying on an absolute value, has in the past been considered useful in diagnosing pre-eclampsia. closer monitoring of pregnant women with an increment in blood pressure of ≥30 mmHg systolic and/or 15 mmHg diastolic is appropriate. Severe hypertension in pregnancy is defined as a systolic blood pressure greater than or equal to 160 mmHg and/or diastolic blood pressure greater than or equal to 110 mmHg. This represents a level of blood pressure above which cerebral auto regulation is overcome in normotensive individuals.

Features of Severe Pre-Eclampsia

1. Blood pressure with patient at rest: systolic ≥160±, diastolic ≥110 mmHg
2. Proteinuria ≥5 g in 24-h urine collection (or 4+ on semi quantitative analysis)
3. Oliguria- 24-h urine output <400–500 ml
4. Pulmonary edema or cyanosis

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5. Epigastric or right upper quadrant tenderness due to stretching of Gilsson's capsule.
6. Visual disturbances, altered consciousness, headache, scotomata or blurred vision
7. Impaired liver function increased Transaminases ±increased Transferases.
8. Thrombocytopenia <100000 cells/mm3 or a rapidly falling count
9. HELLP (Hemolysis, Elevated Liver enzymes and Low Platelets): microangiopathic hemolytic anemia, increased bilirubin and lactate dehydrogenase; elevated liver enzymes secondary to parenchymal necrosis; low platelet count <100000 cells/mm3

Initial Evaluation and General Measures

Patients with severe pre-eclampsia are admitted for continuous evaluation of maternal and fetal condition. Maternal evaluation includes continuous monitoring of blood pressure, heart rate, urine output, cerebral status, and the presence of epigastric pain. Laboratory evaluation includes a platelet count and liver enzymes. Fetal evaluation includes continuous fetal heart monitoring, a biophysical profile, and ultrasonographic assessment of fetal anatomy and an estimated fetal weight.

Control of Severe Hypertension

The objective of treating acute severe hypertension is to prevent potential cerebrovascular and cardiovascular complications such as encephalopathy, cerebral hemorrhage, and congestive heart failure, pulmonary oedema. The most commonly used agent for the treatment of severe hypertension in pregnancy is intravenous Hydralazine given as bolus injection. A recent systematic review suggested that intravenous Labetalol or oral Nifedipine are as effective as each other, and that these two drugs have fewer side effects than intravenous hydralazine.

Prevention of Convulsions

Magnesium sulfate is the drug of choice to prevent convulsions in women with pre-eclampsia. MgSO4…..How it Acts??? Mild vasodilator and central nervous system depressant. Relaxes the myometrium, causes an increase in uteroplacental blood flow.increases the sensitivity to both depolarizing and nondepolarizing muscle relaxants. May cause postpartum uterine atony, especially when oxytocin has been used to augment a long labor. Muscle weakness or apnea in the neonate.

Contraindication of MGSO4

- Absent or very sluggish knee jerk
- Respiratory rate below 16/min
- Urinary output of less than 100ml in the preceding 4 hours (25ml/hr) 10ml vial of 10% calcium gluconate solution is used as antagonist.

MgSO4 Regimens

- Pritchard – loading dose 14 gms, 4 g i.v + 5 g i.m in each buttock. Maintainance 5 g in alternate buttock 4 hrly.
- Zuspan - loading dose 4 gm i.v. Maintainance 1-2 g/h.
- Sibai - loading dose 6 g i.v. over 20 min. maintainance 2gm/hr.

MATERIAL AND METHODS

Source of data

The study will be conducted at the department of Obstetrics and Gynaecology, Pannadhay Rajkiya Mahila Chikitsalaya, R.N.T. Medical College, Udaipur.

Study Period: 12 month period from jan.2014 to dec.2014.

Sample Size: 100 pregnant women with Severe Pre-eclampsia.

Inclusion Criteria

1. All pregnant women with severe preeclampsia with blood pressure ≥ 160/110 mmHg, after taking informed consent from patient and attendees.
2. All pregnant women with proteinuria>++on dipstick.

Exclusion Criteria

1. Pregnant women with pregnancy induced hypertension and mild to moderate preeclampsia(BP<140/100)
2. Pregnant women with previous hytertension or chronic disease.
3. Eclampsia

Procedure

One group of 50 women received a single loading dose of 4gm of $MgSO_4$ was given I.V. after diluting it in 20cc of 5% dextrose over 10-15 min. And simultaneously 10 gm of undiluted 50% $MgSO_4$ was Administered I.M. Another group of 50 women were given complete standard regime According to the Pritchard regime i.e. 14 gm loading dose followed by 4gm I.M. every 4hrs for 24 hrs and in patient with antepartum eclampsia $MgSO_4$ given 24 hrs after delivery and patients with postpartum eclampsia MgSO4 given 24 hrs after fits. Before giving MgSO4 every time checked the knee or other tendon Reflex were present. Respiratory rate was normal (>16 beats/min.) and urine output more than 100ml in last 4 hrs or >25 ml in last hr. Number of fits was observed after MgSO4 given. Side effects due to drug like vomiting, pain or abscess at site of Injection was observed. Serious side effects including respiratory distress, renal failure, cardiac arrest and immediate neonatal outcome was also observed.

OBSERVATIONS AND RESULTS

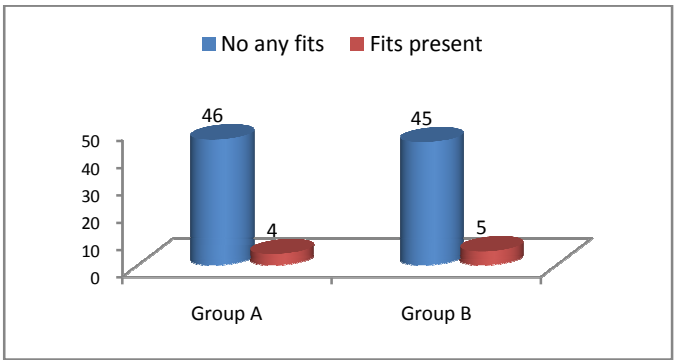

Figure 1: Number of seizures

P Value>0.05, A-control group, B-study group 4 Patients in control group and 5 in study group develop fits. There is statistically no significant difference in fits in both group.

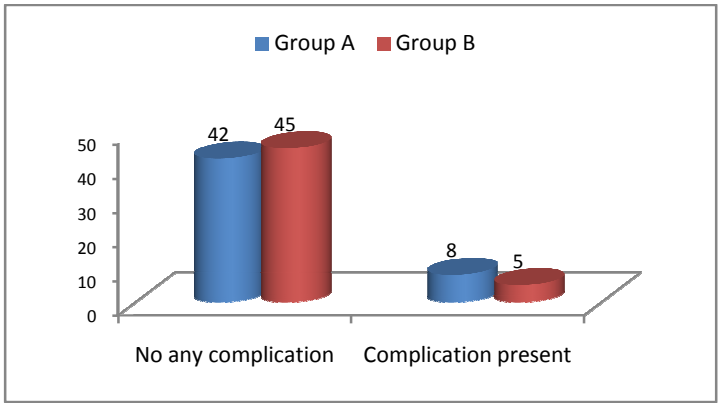

Figure 2: Maternal complications

P VALUE>0.05 8 Patients in control group and 5 in study group develop complication in study group. Maternal complications.

- 3 patients in Group A and 2 patients in Group B developed abruptio placentae.3 patients in Group A and 1 patient in Group B developed atonic PPH.
- 2 patients in Group A and 2 patients in Group B have partial HELLP syndrome with elevated liver enzymes and low platelet count.

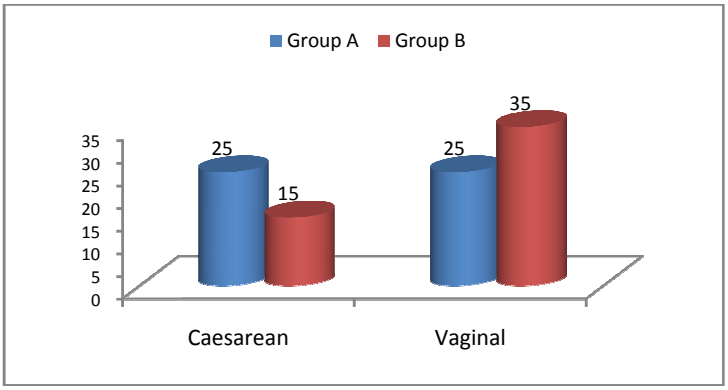

Figure 3: Mode of delivery

P VALUE>0.05, There is statistically no significant difference in method of delivery of both group. 50% patients in group A and 70% in Group B were delivered vaginally. The remaining were delivered by caesarean section. Indications for caesarean section were impending eclampsia/fetal distress.

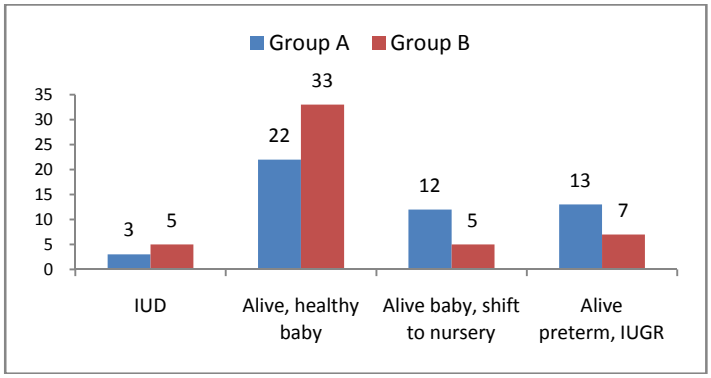

Figure 4: Foetal outcome

P VALUE>0.05**,** There is no significant difference in foetal outcome in both group. Neonates in study group had good APGAR score because they didn't have neonatal hypotonia and magnesium associated toxicity.

DISCUSSION

All the patients were aged between 19 and 40 years. The mean age was 22.12±2.10 years. In Gaddi Suman study the mean age was 19.5 years (range 17-36 years). In Sardesai study the mean age was 22.2 years with age range of 18 -36 years. Most of our patients were primi. This is in accordance with studies like BA Ekele, Niraj N. Mahajan (Padhar regime), Begum. R (Dhaka regime), Suman P. Sardesai, Gaddi Suman and Shikha Seth. The commonest gestational age in study was between 29-36 weeks. The maximum gestational age in study was 40 weeks. It is important to note that the classic triad used to diagnose pre-eclampsia was not present in all women. Systolic B.P ≥ 160 mm Hg was present in 94% of patients. Diastolic B.P ≥ 110 was present in 76% of patients. Significant proteinuria was present in all cases. Edema was absent in 38% cases at the time of admission. Our clinical findings were comparable to that reported by Sibai (23% had mild hypertension, 32% did not have edema).In Gaddi Suman study 66% had severe hypertension, 14% had mild hypertension. Proteinuria was absent in 22% cases and significant proteinuria was present in >50% cases. Presence of blurred vision, epigastric pain, vomiting and severe generalized headache was taken as criteria for impending eclampsia. Convulsions were develop in 8% in Group A and 10% in Group B. 76% in Group A and 84% in Group B received Antihypertensive drug along with magnesium sulphate, but none of them developed profound hypotension/prolongation of labor. 50% in group A and 70% in Group B were induced in view of the impending eclampsia/eclampsia. The remaining were directly taken for caesarean delivery. Indications for caesarean section were impending eclampsia/fetal distress. 3 patient each in Group A and 2 patients in Group B developed abruptio placentae. 3 patients in Group A developed atonic PPH and 1 patient in Group B. 2 patient in Group A and 2 patient in Group B have partial HELLP syndrome with elevated liver enzyme and low platelet count. There were no cases of maternal mortality in the present study. Pritchard *et al*. reported only one maternal death (0.4% maternal mortality) among 245 women with eclampsia. Sardesai *et al*. had reported 2.6% maternal mortality in her study with the low dose regimen in 600 eclampsia cases. Begum *et al*. had reported maternal mortality of 4.5% and 5.0% in low dose and Pritchard regimens, respectively. 70 % in Group A and 80 % in Group B were live and healthy birth. 6% in Group A and 10% in Group B were stillbirth and IUD (Intra uterine death). 18% in Group A and 14% in Group B babies had a birth weight <1500 grams. 24% in Group A and 10 % in Group B were admitted to NICU; majority for the management of pre maturity and Hyperbilirubinemia. Neonates in study group have good apgar score because they don't have neonatal hypotonia and magnesium associated toxicity.

CONCLUSION

Single loading dose magnesium sulfate regime is equally effective as standard regime of magnesium sulfate in controlling and preventing convulsion in impending eclampsia. Though there is a significant difference in serum magnesium levels, there is no statistical difference in the number of convulsions between the two groups. The number of fits was comparable in both groups. It reduces painful repeated I.M. injections and infection at injection site and also reduce the maternal and foetal toxicity due to higher dose of $MgSO_4$ and patients which

receive only loading dose not need to be monitored regularly for urine output, respiratory rate and tendon reflex. Patients who received higher dose require regular monitoring. Both regimens are equally effective for both the mother and fetus and do not affect the obstetric outcome. Low dose magnesium sulfate regime (only single loading dose of $MgSO_4$) is safe and effective and can be offered as an alternative to high dose magnesium sulfate regime (loading dose of $MgSO_4$ followed by maintenance dose) in the management of severe pre eclampsia.

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