

Treatment of Eclampsia with Magnesium Sulphate in Aba, South-Eastern Nigeria.

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Abstract

Context: Eclampsia is a major contributor to maternal and perinatal morbidity and mortality in Nigeria. While it has been widely reported that its prognosis can be greatly improved by effective treatment with magnesium sulphate, experience with this drug for the treatment of eclampsia in Nigeria has been scantily reported.

Objective: To determine the effectiveness and safety of magnesium sulphate in the control of eclamptic convulsion and its influence on maternal and perinatal outcome.

Design, Setting and Subjects: A prospective descriptive study carried out at Nigerian Christian Hospital, Aba, Nigeria from 1st January, 2002 to 29th February, 2004. The study group consisted of 40 consecutive cases of eclampsia seen at the maternity unit during the study period. They were given magnesium sulphate as the only anticonvulsant.

Results: The incidence of eclampsia was 1 in 41 deliveries (2.45%). Magnesium sulphate effectively controlled eclamptic convulsions as 87.5% of cases did not have any further fits after commencement of the drug. There was no incidence of severe adverse reactions to the drug. The only complications of magnesium sulphate observed was depression of deep tendon reflexes which occurred in two patients. There was 1 {2.5%} maternal death and a high perinatal mortality of 55.26%.

Conclusion: Magnesium sulphate is effective in the control of eclamptic fits and has a good maternal outcome. These findings support the use of magnesium sulphate as the drug of choice for control of convulsions in eclamptic women.

Key Words: Eclampsia, Magnesium Sulphate, South Eastern Nigeria.

Introduction

Eclampsia is a serious obstetric complication with increased maternal and fetal morbidity and mortality in both the developing and developed countries.^{1,2,3,4}

The incidence of eclampsia varies from 1 in 2000 deliveries in developed countries to 1 in 100 to 1 in 1700 in developing countries.^{1,2} The reported incidence in Nigeria is between 1 in 254 and 1 in 588 deliveries.^{4,5,6} It is generally believed that eclampsia could be prevented by large scale availability and utilization of modern maternity care and that its poor prognosis could be reduced by effective management.^{2,3,4,5} Globally, eclampsia probably accounts for 50,000 maternal deaths annually.^{3,7} The morbidity and mortality from it is said to be related to the number of convulsions.⁸ The control of convulsions is therefore significant in reducing maternal morbidity and mortality.⁸ While diazepam, phenytoin sodium, chlormethiazole and lytic cocktail can be used for control of eclamptic fits, a number of studies within the last decade have provided overwhelming evidence for the superiority of magnesium sulphate as a drug of choice for control of eclampsia.^{3,7,8,9,10,11} While this evidence is said have had a dramatic effect on practice in many countries, there are few reports on the use of magnesium sulphate for eclampsia in Nigeria.^{13,15}

The objectives of this study therefore, were to determine the effectiveness and safety of magnesium sulphate in the control of eclamptic convulsion and its overall influence on maternal and perinatal outcome in a rural Nigerian setting.

Materials and Methods

This is a report of a 26-month prospective descriptive study, assessing the efficacy, safety, maternal and perinatal outcome of magnesium sulphate used in the treatment of 40 cases of eclampsia at Nigerian Christian Hospital Aba, Abia state. This mission hospital, situated at kilometer 18 along Aba-Ikot-ekpenne road serves as general hospital and a referral center in obstetrics, gynaecologic and general surgery for Abia south and the neighboring rural communities of Akwa Ibom state. The average yearly antenatal clinic attendance is 2500 and about 840 deliveries are carried out in it yearly.

The study period was from January 1 2002 to February 29, 2004. All women with clinical diagnosis of eclampsia were included in the study while those with other causes of convulsion were excluded. In our center, the treatment for eclampsia involved the maintenance of the airways, control of fits and hypertension and delivery of the fetus regardless of the duration of pregnancy. All cases underwent a physical examination, a special neurologic evaluation and routine laboratory investigations. Fits were controlled with magnesium sulphate as the only anticonvulsant. The magnesium sulphate was sourced from the open market (Ariaria international market, Aba.)

Our treatment protocol was a modification of the Zuspan regimen with an intravenous loading dose of 4g

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given over 5-10 minutes followed by a maintenance intravenous bolus of 1g/hour continued for 24 hours after the last seizure. Recurrent fits were treated by a further bolus of 2g. Magnesium sulphate was withheld whenever the deep tendon reflexes were absent and when the urinary output was less than 30mls per hour. 10% calcium gluconate was made available in the labour ward should any respiratory arrest arise. The blood pressure, respiratory rate, hourly urinary output, fetal heart and the presence of knee jerk reflexes were strictly monitored. The lung bases were frequently auscultated to avoid circulatory overload and pulmonary oedema. Severe hypertension (diastolic >110mmHg) was managed with bolus injection of 5mg of hydrallazine intermittently. Vaginal misoprostol was the preferred method for inducing labour.

Table 1:
Age and Parity Distribution in Eclampsia

Parameter	Number of Cases	Percentage
<u>Age Group</u>		
15-19	4	10.0
20-24	4	10.0
25-29	17	42.5
30-34	5	12.5
35-39	6	15.0
40-44	2	5.0
<u>Parity</u>		
0	9	47.5
1-4	16	40.0
= 5	5	12.5

Results

During the 26 months period (January 2002 to February 2004) there were 40 patients with eclampsia among 1635 deliveries (1 in 41 deliveries or 2.45%). Only 3 (7.5%) of these patients received antenatal care in our hospital, while the majority 37 (92.5%) were unbooked. 3(7.5%) of the patients had a previous history of eclampsia. 27(67.5%) of the patients convulsed for the first time in the antenatal period, 5(12.5%) had intra-partum eclampsia and 8(20%) had post-partum eclampsia.

The age distribution of the eclamptic cases is shown in table 1. Only 4(10%) of the eclamptics were less than 20 years of age. The highest incidence of 42.5% was among the age group 25-29 years. The distribution of the patients according to parity is shown on table 1. 19(47.5%) of the cases were nulliparous. High parities of five or more were observed in 5(12.5%) cases. The mean gestational age of the eclamptic cases was 33.7 weeks, range: (22-42 weeks.) Eclampsia occurred at less than 28 weeks in 6 cases, at 28-36 weeks in 13 cases and at term in 15 cases. Eclampsia was more frequent during the rainy season with 26(65%) occurring between April and October and 9(22.5%) occurring

between November and March (dry season). 37(92.5%) of the patients had their first convulsion at home, while 3(7.5%) occurred in our hospital(2 post-partum cases and 1 intra-partum case).

Among all the patients with eclampsia, the total number of fits before commencement of magnesium sulphate was 132 with a range of 1-15 and a mean of 3.3. Only 5(12.5%) patients had fits after commencement of magnesium sulphate. In one of the patients, the giving of magnesium sulphate was limited by the presence of acute renal failure. The total number of fits after commencement of magnesium sulphate was 9 with a range of 1-3 and a mean of 0.2.

All the 40 patients with eclampsia had hypertension. 33(82.5%) had proteinuria, 19(47.5%) had oedema and 24(60%) had exaggerated deep tendon reflexes. Of the 32 ante-partum and intra-partum cases, as many as 10(31.25%) had no fetal heart on admission. 34(85%) achieved vaginal delivery while only 4(10%) were delivered by emergency caesarian section. The indications caesarian section were failed induction(2), 3 previous caesarean section(1) and Failure to progress in labour(1).

Of the 27 cases who were not in labour on presentation, 16(59.25%) had induction of labour with vaginal misoprostol. The only complication of magnesium sulphate observed in this series was depression of the deep tendon reflexes which was observed in two patients.

Maternal complications of eclampsia were observed in 5 patients: 2 acute renal failure, 1 pulmonary oedema, 1 papilloedema and 1 laceration of the tongue. There was one(2.5%) maternal death from acute renal failure. Of the 38 babies born to women with ante-partum/intra-partum eclampsia, 21 babies were dead giving a high perinatal mortality rate of 55.26%. 48% of these however were intra-uterine fetal death before admission. 3(14.29%) of the perinatal deaths were in the early neonatal period while the remainder(86%) were still births. The mean birth weight of all the babies born to the eclamptics was 2.2kg.

Discussion

The 2.45% incidence of eclampsia in this study is higher than that reported from other parts of Nigeria.^{4,5,6} It is only lower than the 7.71% reported from Turkey.² It is significantly higher than 0.05% reported from the developed countries.^{1,3} The factors that may be responsible for the high incidence of eclampsia in our hospital include our total number of deliveries and the fact that it is a referral center for complicated cases in our catchment area.

The parity and gestational age distribution of the cases are similar to those in other reports.^{2,4,5} The

preponderance of eclamptic cases in the rainy season as observed in this study, has been reported by others⁴ While the reason for this remains unknown, its knowledge would assist in the proportionate distribution of materials required for control of eclampsia. 22(55%) patients had had 3 or more episodes of convulsion before presentation. This may not be unconnected with delay in starting treatment.

In order to avoid a sudden excess in administration of magnesium sulphate with its obvious deleterious effect on the mother and the fetus, the intramuscular magnesium sulphate (Pritchard regimen) is preferred to the continuous infusion (Zuspan regimen) in centers (like ours) where infusion pumps are not available.^{16,17} We were however constrained to use a modified form of the intravenous regimen because only 10% solution of magnesium sulphate was available to us during the study period. An initial loading dose of 10g of 10% magnesium and a maintenance dose of 4g four-hourly (Pritchard regimen) would have meant giving an initial 100mls and subsequent 40mls of a painful injection intramuscularly. This was considered inexpedient.

Magnesium sulphate effectively controlled eclamptic convulsions as only 12.5% of cases in this study, had further fits after its commencement. This is in keeping with the widely reported effectiveness of magnesium sulphate in the control of convulsions in eclampsia.^{3,7,8,9,10,11} It is however at variance with the recurrence of seizures in 26.5% of cases observed with the use of phenytoin sodium in South Africa¹⁴ and the recurrent rate of 27.9% observed with the use of diazepam in the Eclampsia Collaborative Trial.³ It has also been demonstrated that magnesium sulphate is superior to lytic cocktail in the control of eclamptic seizures.¹¹

Five patients had further seizures after commencement of magnesium sulphate. In one case a loading dose of

magnesium sulphate was given according to our protocol. However after one hour the urinary output was less than 30mls. Therefore no subsequent doses were given. The reason for further seizures in the remaining 4 cases was not apparent but may be in keeping with the observation that 10-15% of eclamptics will experience a further convulsion after receiving a loading dose of magnesium.^{3,9} The safety of magnesium sulphate observed in this study has been reported by others.^{3,9,13} The therapy was safely monitored by hourly measurement of patellar reflex, urinary output and respiratory rate. Major adverse reactions were thus avoided since the abolition of the patellar reflex is said to occur well before serious toxic effects.¹²

The caesarean section rate of 10% observed among the eclamptics in this study is markedly lower than that reported in other studies.^{2,4,5,6} Maternal mortality of 2.5% obtained in this study is low when compared with figures from other parts of Nigeria.^{4,5,6} This may be related to the effective control of fits achieved in this study. It is however higher than the figure reported from the developed countries where intensive care facilities for the management of such cases are readily available.¹³ The perinatal mortality of 55.26% is very high compared to those of other reports.^{4,5,6,13} It is only comparable to what was obtained in Turkey.² The main cause of this high perinatal mortality was the high number of intra-uterine fetal deaths on admission. Prematurity was also contributory. It is our belief that electronic fetal monitoring, appropriate timing of deliveries and advances in neonatal care will be effective in increasing survival rates for infants of eclamptic mothers.

It is concluded that magnesium sulphate is highly effective in the control of eclamptic fits with no major adverse reaction but good maternal outcome. The results support the use of magnesium sulphate as the drug of choice for control of convulsion in women with eclampsia.

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