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Original Research Article

Shortened versus standard post-partum maintenance therapy of magnesium sulphate in severe pre-eclampsia: a randomised control trial

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ABSTRACT

Background: Pre-eclampsia is a pregnancy-associated multi-organ disorder caused by altered trophoblastic invasion and endothelial cell dysfunction. It is associated with significant maternal and perinatal morbidity and mortality, especially in developing countries. Magnesium sulphate ($MgSO_4$) is effective in the management of severe pre-eclampsia/eclampsia. Objective of this study was to compare the effectiveness of a shortened course of $MgSO_4$ to the Pritchard regimen in patients with severe pre-eclampsia

Methods: This study was carried out at the obstetrics and gynecology department of the Obafemi Awolowo University Teaching Hospital, Ile-Ife. It was a randomised control study of 116 patients, 58 in each group. Group A received the standard Pritchard regimen: a loading dose of $MgSO_4$ 4g slow IV bolus plus 10 g IM (5 g in each buttock), followed by maintenance dose of 5g $MgSO_4$ IM 4-hourly into alternate buttocks until 24 hours after delivery. Group B received same loading dose, but the maintenance dose was limited to three doses of 5g $MgSO_4$ IM four hours apart after delivery. In both regimens, 2g $MgSO_4$ was given IV for breakthrough fit. Data were analyzed using SPSS version 20.

Results: This study revealed that twelve-hour postpartum $MgSO_4$ was as effective as the Pritchard regime with no statistically difference in occurrence of seizures ($X^2 = 0.341$, df = 1, p = 0.514). The average total dose of magnesium sulphate used was lower in the study Group B.

Conclusions: Twelve-hour postpartum $MgSO_4$ is as effective as the standard 24-hour Pritchard regime.

Keywords: Preeclampsia, maternal/perinatal morbidity and mortality, Pritchard regimen, $MgSO_4$

INTRODUCTION

Preeclampsia is a pregnancy-associated multi-organ disorder caused by altered trophoblastic invasion and endothelial cell dysfunction.[1] It is associated with maternal and perinatal morbidity and mortality especially in developing countries.[2] Preeclampsia is a pregnancy-specific disease characterised by hypertension and proteinuria arising after the 20th week of gestation in a previously normotensive and non-proteinuric woman.[3] It complicates 5-10% of pregnancies worldwide, and can be antepartum, intrapartum or post-partum.[4] The aetiology of pre-eclampsia is unknown, however there are proposed theories which centre on defective placental implantation and the level of trophoblastic invasion.

The risk factors for pre-eclampsia may be high risk or moderate risk factors. High risk factors include

hypertensive disease during a previous pregnancy, chronic kidney disease, autoimmune disease such as systemic lupus erythematosus or antiphospholipid syndrome, type 1 or type 2 diabetes mellitus, or chronic hypertension.[5] Moderate risk factors include first pregnancy, age 40 years or older, pregnancy interval of more than 10 years, body mass index of 35 kg/m^2 or more at first visit, multiple pregnancy and family history of pre-eclampsia.[5]

Other risk factors for pre-eclampsia include black race, assisted reproductive technology, change of spouse, history of pre-eclampsia in the mother, and spouse being product of a pregnancy complicated by pre-eclampsia.[6,7] Preeclampsia is essentially a disease of the primigravida and it is more common in the age group of <20 and >35 years. It can be present in the multipara in the presence of change of spouse, long inter-pregnancy interval, multiple pregnancies, molar pregnancy, chronic hypertension and chronic renal disease.

Preeclampsia is classified as mild or severe. In mild preeclampsia, diastolic blood pressure is <110 mmHg; and/or systolic blood pressure is <160 mmHg, there is significant proteinuria with the absence of symptoms and signs. In severe preeclampsia, diastolic blood pressure of ≥110 mmHg, systolic blood pressure of ≥160 mmHg and/or marked proteinuria ensues. The presence of symptoms, signs and biochemical changes can also classify preeclampsia as severe. These include headaches, persistent visual disturbances, vomiting, epigastric pain, cyanosis, pulmonary oedema, oliguria, impaired liver function or hepatocellular damage, haemolysis, thrombocytopaenia, oligohydramnios and foetal growth restriction.[3]

The principle of management of severe pre-eclampsia are prevention of fits, control of blood pressure and to expedite delivery by the most judicious route while investigating to exclude and treat possible complications. For the purpose of seizure treatment and prophylaxis in pre-eclampsia and eclampsia magnesium sulphate is the ideal anti-convulsant.[8,9]

The effectiveness of $MgSO_4$ in patients with severe pre-eclampsia was ascertained by the Magpie trial.[8] This randomised, placebo-controlled study revealed that women allocated magnesium sulphate had a 58% lower risk of eclampsia than those allocated placebos. Maternal mortality was also lower among women allocated $MgSO_4$.

$MgSO_4$ was first introduced to control convulsions in 1925, but it was the collaborative eclampsia trial that confirmed the efficacy of $MgSO_4$ in the treatment of eclampsia compared with diazepam and phenytoin.[10,11] This randomised control trial reported that women treated with $MgSO_4$ had a 52% and 67% lower recurrence of convulsions than those treated with diazepam and phenytoin, respectively.

The exact mechanism of action of $MgSO_4$ still remains unknown, the hypotheses on how it works include; reduced presynaptic release of the neurotransmitter glutamate, blockade of glutamatergic N-methyl-D-aspartate (NMDA) receptors, potentiation of adenosine action, improved mitochondrial calcium buffering, and blockage of calcium entry via voltage-gated channels.[12] Hippocampal seizures can be blocked by magnesium; this implicates the NMDA receptor in eclamptic convulsions and also confirms that magnesium has a central anticonvulsant effect.

The World Health Organization (WHO) has recommended $MgSO_4$ as the most effective, safe, and low-cost drug for the treatment of severe pre-eclampsia and eclampsia.[13] The drug has remained unavailable in several developing countries (including Nigeria) especially in the rural areas particularly primary and secondary health facilities where it is incidentally needed the most. This drug is not cheap either, as a vial of 5g costs about eight hundred (800) naira which is about 2.2 US dollars. In several tertiary institutions accredited for postgraduate training, $MgSO_4$ is not found in the emergency trays of their labour wards even though it is available in their pharmacy.[14] The situation is better imagined at the secondary and primary health care centres. Factors responsible include the lack of guidelines on its use, non-inclusion in many national essential drug lists, the wrong perception that the drug is meant for use only at the highest level of facilities (such as those with intensive care facilities), lack of training of health workers on its use, cost of the drug and its availability.[14]

Despite the benefit of this drug, its toxicity is still a major concern. A potential concern is the risk of side effects which could increase with the duration of treatment especially if there are challenges in clinical monitoring of the patients. Similarly, the cost of therapy would inevitably increase with the duration of treatment.

Magnesium sulphate administration is recommended for all women with severe pre-eclampsia.[15-17] Consensus is yet to be reached on the ideal duration of prophylactic postpartum anticonvulsant therapy.[16,18] Traditionally, the use of $MgSO_4$ has been recommended for 24 hours following delivery, the period of greatest risk for the occurrence of eclampsia.[15]

Essentially, there are two standard protocols for using $MgSO_4$ as anticonvulsant in preeclampsia or eclampsia. With the Zuspan regimen, an initial intravenous bolus dose of 4 g is given slowly over a period of 5-10 minutes and maintenance is with 2 g hourly by intravenous infusion for 24 hours using infusion pump.[18] In the absence of an infusion pump, which is what is obtained in most low resource settings, the readily available gravity-fed drip sets could be used instead and then rely on the duty staff to monitor the rate of infusion.[19] It is a task that is by no means easy in a busy maternity unit with few midwives on duty. The second protocol is the Pritchard

regimen, which is also initiated by giving 4g bolus $MgSO_4$ intravenously over 5-10 minutes, and simultaneously administering 10 g intramuscularly (5g each buttock). This is then followed by 5g intramuscularly at four-hour intervals into alternate buttock for twenty-four hours after the last convulsion or delivery, whichever occurred last.[20]

The current tradition regarding the appropriate duration of postpartum seizure prophylaxis still remains 24 hours. Some workers had modified this regimen by limiting the maintenance doses to no maintenance at all, 8 hours or 12 hours instead of 24 hours with equally good result.[20] However, there is no consensus on replacement of the 24 hours maintenance dose. The practice varies from centre to centre. In the absence of such a consensus, $MgSO_4$ is still administered for 24 hours after delivery.

World Health Organisation estimates that preeclampsia is seven times higher in developing countries than in developed countries.[1] This study was carried out to compare the effectiveness of a shortened course of $MgSO_4$ to the Pritchard regimen in patients with severe pre-eclampsia in a tertiary hospital in South-West Nigeria.

METHODS

This study was carried out at the obstetrics and gynecology department of the Obafemi Awolowo University Teaching Hospital, Ile-Ife. It was a randomised control study. The study population consisted of 116 consecutive patients that presented with severe pre-eclampsia to the labour ward of the hospital between March 2015 and September 2015.

All patients with features of severe pre-eclampsia were included in the study. Patients that were excluded from the study were referred patients who had already received initial dosages of magnesium sulphate in the referring centre in whom four hours had elapsed before presentation or the loading dose time of last dose was not indicated in the referral letter; patients who were planned for conservative management; patients who had received any other anti-convulsant before arrival; patients who had received suboptimal loading dose of magnesium sulphate before arrival; patients that had features of heart failure; patients diagnosed of renal failure and patients with features of pulmonary oedema. Women who were eligible were counselled, and after obtaining an informed consent, they were enrolled in the study.

In an earlier study on pre-eclampsia, there was a need to extend the maintenance dose of $MgSO_4$ in 6.9% of the patients with mild pre-eclampsia, therefore 12-hour maintenance dose was effective in 93.1% of the study population.[21] Using the above result and accepting a study power of 80%, confidence interval of 95%, a study to control ratio of 1:1, an acceptable attrition rate of 10%, and with the aim of achieving a 15% minimum detectable difference in the seizure recurrent rates, sample size for each study group was determined using the statistical formula for comparison of two proportions using the Sathain et al, formula as follow:[22]

$$N = \frac{(P)\,(1-P)\,(Z\beta + Z\alpha/2)2}{(P1 - P2)2}$$

Where,

N = Sample size in the case group
(P) (1-P) = A measure of variability
Z_β = represents the desired power (typically 0.84 for 80% power)
$Z_{\alpha/2}$ = represents the desired level of statistical significance (typically 1.96)
P_1-P_2 = Effect size (difference in proportions)
P_1 = seizure prevention rate among study population in earlier study = 93.1% or 0.931
P_2 = Proportion of participants in the study group expected to exhibit the outcome of interest. This is usually set relative to P1.
$P = (P_1 + P_2)/2$

A minimum detectable difference in seizure prevention rate of 15% using the 12-hour maintenance dose of MgSO4 in patient with pre-eclampsia was determined.

15% of P1	=	15/100 x 0.931
	=	0.140
Therefore P2	=	0.931-0.140
	=	0.791
P	=	Average of P_0+P_1
	=	0.931 + 0.791/2
	=	0.861

$$N = \frac{(0.861)\,(0.139)\,(1.96 + 0.84)2}{(0.931 - 0.791)2}$$

	=	0.938/0.1402
	=	0.938/0.0196
	=	48 patients per study group.

A total of 96 subjects were required to make the results statistically significant. However, a proportion of study participants that may be lost to follow up in this study was put at 10% (≈10) and added to the sample size gave a total of 116 patients. A total of 58 patients for each study group (A and B). For the purpose of this study, severe pre-eclampsia was diagnosed when diastolic blood pressure of ≥110 mmHg and systolic blood pressure of ≥160 mmHg in the presence of proteinuria of at least 1+ on dipstick. It was also diagnosed when the diastolic blood pressure was >90mmHg but <110 mmHg; and/or systolic blood pressure was >140 mmHg but <160 mmHg with any of proteinuria of 5 g/24 hours or ≥3+ in dipstick urinalysis, serum creatinine >1.2 mg/d, platelets counts of <100,000/L, evidence of microangiopathic haemolysis

(increased LDH), elevated serum transaminase levels-ALT or AST, persistent headache or other cerebral or visual disturbance, persistent epigastric pain. Two registrars and two nurses each from the labour and postnatal wards that were involved in this study underwent training on the research work. This enabled them to inform the researchers whenever a patient with severe preeclampsia arrived the labour ward or the postnatal ward. History was obtained from these patients, investigation result noted and documented on a proforma.

The 116 patients were randomised into two groups of 58 each. In study Group A, the standard Pritchard regimen was used: a loading dose of $MgSO_4$ 4 g slow IV bolus, plus 10 g IM (5g in each buttock), followed by a maintenance dose of 5g magnesium sulphate IM four-hourly in alternate buttock for twenty-four hours after delivery or 24 hours from the loading dose for post-partum patients. In study Group B, the same loading dose was used but the maintenance dose was limited to three doses of 5g magnesium sulphate IM 4 hours apart after delivery or for 12 hours from the loading dose for post-partum cases. In both regimens, 2 g $MgSO_4$ was given IV when there was occurrence of fit.

All patients were monitored for development of $MgSO_4$ toxicity by hourly check of respiratory rate, patellar reflexes and urinary output through an indwelling Foley's urethral catheter. $MgSO_4$ toxicity was managed by discontinuation of $MgSO_4$ and administration of 10 ml of 10% calcium gluconate over 10 minutes intravenously. Blood pressure was also monitored hourly, When the diastolic blood pressure was 110 mmHg or more, IV hydralazine 10 mg was given slowly. After stabilization, delivery was by emergency Caesarean section if the cervix was unfavourable or labour was not established. However, when the cervix was favourable, induction of labour was carried out. Augmentation of labour was instituted if the patient was already in labour. Both maternal and perinatal outcomes were recorded.

The primary outcome measure was occurrence of fits. When fit occurred after 12 hours but within 24 hours in the study group, 2g intravenous bolus dose was given, then maintenance dose extended to complete 24 hours. However, when fit occurred in either of the groups after 24 hours, standard maintenance dose of Pritchard's regimen was given, after confirming that the seizure was not as a result of other pathologies. The need to extend the duration of maintenance dose of $MgSO_4$ was also determined based on the persistence of clinical symptoms and signs of imminent eclampsia noted in both groups after completing the assigned regimen.

Statistical analysis

Data were analyzed using statistical software (SPSS for windows® version 20, SPSS Inc.; Chicago, USA) and results are presented in tables, frequencies and percentages.

RESULTS

Table 1 shows the distribution of patients' socio-demographic characteristics. Most (69.8%) of the patients were less than 30 years old, there were more (51.7%) booked than unbooked patients and most (46.6%) were primigravida. Severe pre-eclampsia occurred most (37.1%) from 37 to 38 weeks gestational ages.

Table 1: Distribution of patients' socio-demographic characteristics.

Characteristics	Frequency (%)
Age (in years)	
<30	81 (69.8%)
31-40	33 (28.5%)
41-50	2 (1.7%)
Total	116 (100%)
Gestational age (in weeks)	
<36	10 (8.6%)
36	11 (9.5%)
37-38	43 (37.1%)
39-40	40 (34.5%)
>40	12 (10.3%)
Total	116 (100%)
Booking status	
Booked	60 (51.7%)
Unbooked	56 (48.3%)
Total	116 (100%)
Gravidity	
1.00	54 (46.6%)
2.00	22 (18.95)
3.00	11 (9.5%)
≥4.00	29 (25%)
Total	116 (100%)

Table 2: Types of pre-eclampsia.

Types	Frequency (%)
Antepartum	43 (37%)
Intrapartum	56 (48.3%)
Post-partum	17 (14.7%)
Total	116 (100%)

The most pronounced type of pre-eclampsia among the patients was intrapartum, followed by antepartum, while the least experienced was post-partum. Table 2 shows the frequency of occurrence of the types of pre-eclampsia.

As shown in Table 3, proteinuria of 4++++ and headache alone were the most common features of disease severity among the patients. Other features of severity occurring with headache were also observed in some patients.

Table 4 shows that majority 97.4% of the patients did not have fit, while 2.6% had and there was no statistically significant difference across the two groups ($X^2 = 0.341$, df = 1, p = 0.514). Similarly, 97.4% did not have features of toxicity and there was no significant difference

between the two groups (X^2 = 0.325a, df = 1, p >0.569). More (55.3%) of the patients were delivered through Caesarean section and there was no significant difference in the maternal and foetal outcomes across the both groups.

Table 3: Features of severity of preeclampsia.

Characteristics	Frequency (%)
Proteinuria dipstick	
2++	6 (5.2%)
3+++	46 (39.7%)
4++++	64 (55.1%)
Total	116 (100%)
Other signs of severe disease	
Headache alone	59 (72.8%)
Dizziness alone	4 (5%)
Blurred vision alone	3 (3.7%)
Blurred vision and dizziness	1 (1.2%)
Headache and dizziness	3 (3.7%)
Headache and blurred vision	2 (2.5%)
Headache and epigastric pain	4 (5%)
Headache and vomiting	3 (3.7%)
Headache and brisk reflexes	1 (1.2%)
Headache and diplopia	1 (1.2%)
Total	81 (100%)

Table 5 reveals that majority (98.3%) did not have extended duration of maintenance dose of $MgSO_4$, and there was no significant difference between the groups. The level of patient's compliance revealed that 93.1% complied and there was no significant difference in this behaviour among the two groups. Among the 8 patients that did not comply, 37.5% was due to cost alone, followed by 50% due to cost and absence of symptom, and 12.5% due to cost and discomfort.

Table 6 shows that there were no significant differences in the various parameters between the two groups, except in the total dose of $MgSO_4$ used (where a statistically significant lower total dose was used in Group B), number of days on admission and duration in labour which were shorter in Group B.

DISCUSSION

In this study, it was observed that majority of the patients (69.8%) were < 30-year-old. This was higher than 31.3% observed at the Ladoke Akintola University of Technology Teaching Hospital, 42.4% at the University of Calabar Teaching Hospital, Calabar, and 50.6% in Enugu.[23-25] An incidence of 38.4% was observed at the Liaquat University Hospital Hyderabad among patients less than 20 years of age.[24]

Table 4: Patients' response to treatment.

Treatment outcome	Group		Total	X^2	Df	p value
	A	B				
Occurrence of fit						
No	56 (48.3%)	57 (49.1%)	113 (97.4%)	0.321[a]	1	0.514
Yes	2 (1.7%)	1 (0.9%)	3 (2.6%)			
Total	58 (50.0%)	58 (50%)	116 (100.0%)			
Occurrence of toxicity						
No	56 (48.3%)	57 (49.1%)	113 (97.4%)			
Yes	2 (1.7%)	1 (0.9%)	3 (2.6%)	0.325[a]	1	0.569
Total	58 (50.0%)	58 (50.0%)	116 (100.0%)			
Mode of delivery						
Vaginal delivery	26 (22.4%)	27 (23.3%)	52 (45.7%)			
Caesarean section	32 (27.6%)	31 (26.7%)	64 (54.3%)	0.029[a]	1	0.865
Total	58 (50.0%)	58 (50.0%)	116 (100.0%)			
Perinatal Outcome						
Alive normal	46 (39.7%)	43 (37.1%)	89 (76.8%)			
Alive asphyxiated	6 (5.1%)	7 (6.0%)	13 (11.2%)	0.464[a]	3	0.927
Fresh still birth	3 (2.6%)	3 (2.6%)	6 (5.1%)			
Macerated still birth	3 (2.6%)	5 (4.3%)	8 (6.9%)			
Total	58 (50.0%)	58 (50.0%)	116 (100.0%)			
Maternal outcome						
Alive	57 (49.1%)	58 (50.0%)	115 (99.1%)			
Acute renal failure	1 (0.9%)	0 (0.0%)	1 (0.9%)	1.026[a]	1	0.311
Total	58 (50.0%)	58 (50.0%)	116 (100.0%)			

Preeclampsia occurred more (46.6%) in primigravid women. This is consistent with what is already known about preeclampsia as being more prevalent in the primigravid women. This value was close to 49.4% from

the University of Nigeria Teaching Hospital Enugu, but lower than 81.4% from Birnin Kudu.[26,27] The exact cause of preeclampsia remains unclear, however there are proposed theories. Immune maladaptation of primigravid women is responsible for the higher incidence of preeclampsia in this group of pregnant women. This maladaptation is not present in subsequent pregnancies. This results in the reducing incidence of preeclampsia in multiparous women. Maladaptation also explains the reason multiparous women develop preeclampsia when they become pregnant for a new consort.[26,28,29]

Table 5: Treatment outcomes.

Outcomes	Group		Total	X^2	Df	p value
	A	B				
Extension of maintenance dose duration						
No	58 (50.0%)	56 (48.3%)	114 (98.3%)			
Yes	0 (0.0%)	2 (1.7%)	2 (1.7%)	2.071[a]	1	0.150
Total	58 (50.0%)	58 (50.0%)	116 (100.0%)			
Patient Compliance						
No	5 (4.3%)	3 (2.6%)	8 (6.9%)			
Yes	53 (45.7%)	55 (47.4%)	108 (93.1%)	2.669[a]	1	0.102
Total	58 (50.0%)	58 (50.0%)	116 (100.0%)			
Reason for non-compliance						
Cost	2 (25.0%)	1 (12.5%)	3 (37.5%)			
Cost and absence of symptoms	2 (25.0%)	2 (25.0%)	2 (50.0%)			
Cost and discomfort	1 (12.5%)	0 (0.0%)	1 (12.5%)			

Table 6: Mean differences in the scores of parameters in groups A and B.

Parameters	Group mean (SD)		T	Df	p value
	A	B			
Age	27.7 (6.7%)	26.7 (5.9%)	0.8	112.1	0.429
Systolic BP on admission	180 (23.3%)	178.1 (19.3%)	0.5	110.2	0.640
Diastolic BP on admission	98.4 (32.3%)	105.1 (23%)	-1.3	103.0	0.203
Total dose of $MgSO_4$ used (g)	48.5 (5.5%)	32.2 (5.4%)	15.9	110.3	0.000
Number of days on admission	10.6 (4.2%)	8.8 (4.3%)	2.2	105.9	0.029
Duration of labour in hours	8.5 (4.0%)	6.4 (4.9%)	2.0	67.3	0.047

The incidence of antepartum preeclampsia was 37% which was higher than the 16.6% reported by Raghuraman et al.[30] Intrapartum pre-eclampsia was the most common form of presentation (48.3%). The incidence of post-partum pre-eclampsia in this study was 14.7% which was the lowest. It was lower than 55% reported by Yancey et al.[31] Headache was the symptom of severity that occurred most at presentation in this study. It is usually one of the first symptoms that the patient experiences when the blood pressure is elevated. Headache also occurred with other symptoms of severity in this study.

The yardstick that was used to measure the efficacy of $MgSO_4$ was the occurrence of convulsions after the patient was started on $MgSO_4$. In this study 2.5% patient had convulsion after commencement of $MgSO_4$, and this was different from the finding of none by Ehrenberg et al and Maia et al.[21,32] However, the convulsions in this study occurred within 10 minutes of administering of the loading dose when the therapeutic level of magnesium may not have been reached. This study revealed that there was no statistical difference between the two regimens tested ($X^2 = 0.341$, df = 1, p = 0.514).

The other yardstick used to measure the efficacy of magnesium sulphate in the management of severe pre-eclampsia was the need to extend the duration of maintenance doses due to persistence of symptoms and signs of worsening disease. In this study maintenance doses were extended in 2 patients (3.4%) in the study group and non in the control group. This finding was lower than 6.9% reported by Ehrenberg et al and 7.0% reported by Isler, but higher than 1.3% reported by Darngawn et al and 0% reported by Maia et al.[21,32-34]

The compliance of patients in each group was also used to measure the convenience of the shorter regimen against the standard regimen. Only one patient in the study group was not compliant compare with 5 in the control group. Majority of the non-compliance had to do with the cost of the drug. Toxicity was observed in 1.8% of women in the study group and 3.4% in the control group.

As expected, the study group used a lower average total $MgSO_4$ dose of 32.2 g compared to 48.5 g in the control group. This translates to a difference of about 16.3 g of $MgSO_4$ (about 3 vials). Considering the current cost of $MgSO_4$ in our facility pharmacy at 800 naira per vial, patients in the study group saved about 10 USD. This is higher than 7 USD reported by Darngawn.[34] Other economic benefit of the shorter postpartum dose would be the savings from indirect costs of consumables such as syringes and needles, and the cost implications of the time spent by nurses to administer the injections. The time spent by doctors and nurses on longer monitoring for side effects and toxicity can be channeled to other patients especially in this part of the world where there is acute shortage of medical and nursing staff.

Additional benefit of shorter postpartum regimen includes reduction of the risk of drug toxicity, and side effects of more injections such as pain and injection site abscess.

The limitation of this study was that it was a hospital-based study. The results may not reflect the findings in other tertiary institutions in Nigeria or the West African sub-region.

CONCLUSION

In this study, preeclampsia was more among primigravid women and those less than 30-year-old. Intrapartum preeclampsia was higher than ante- and post-partum preeclampsia. Educating, encouraging and counselling women on the need to embrace good health-seeking behaviour are key, because embracing good health-seeking behaviour would help make early diagnosis and manage preeclampsia as early as possible.

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