

Original Article

Maternal Complications of Severe Pre-Eclampsia at a Tertiary Level Hospital In Zambia

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ABSTRACT

Objectives: The objective of the study was to describe the maternal outcomes and mode of delivery among women with Severe pre-eclampsia (SPE) admitted to the University teaching Hospitals- Women and Newborn Hospital (UTH-WNH).

Materials and Methods: This descriptive study analysed cases of 175 women with Severe Preeclampsia admitted to the Mother and New Born Hospital between June and December 2017. Women meeting the criteria were identified antenatal and enrolled into the study after delivery to obtain data using the maternity record book and face-face interviews for clarification.

The data was analysed using SPSS to obtain frequency distributions of outcomes of interest that was illustrated in charts and tables.

Results: The age range for the women was 15 - 41 years. Frequency of complications from SPE increased with advancing age towards 35 years and above. Unemployment and living in low cost housing was associated with higher risk of complication from SPE.

HELLP Syndrome occurred in 10.3% of women with SPE and so did placental abruption. IUFD was a complication in 28% of the pregnant women. Most women (34%) delivered through induction of labour. The 30-34 weeks was the peak gestation

period associated with the most complications of SPE in the pregnant women.

Conclusion: SPE is a pregnancy condition with serious potential consequences for the mother and the fetus.

INTRODUCTION

Preeclampsia is a multisystem disorder that complicates 3–8% of pregnancies and is a major source of morbidity and mortality worldwide.¹ This is a disease unique to pregnancy typically characterized by blood pressure $\geq 140/90$ mmHg after 20 weeks gestation and associated with proteinuria ≥ 300 mg/24 h or $\geq 1+$ dipstick. About 10-15% of maternal deaths are directly associated with pre-eclampsia and eclampsia particularly in developing countries.² Mounting evidence in recent years suggest that preeclampsia has important implications for future maternal health, in particular cardiovascular health.

Preeclampsia is characterized as mild or severe based on the degree of hypertension, proteinuria and the presence of symptoms resulting from involvement of systemic organs. Left untreated the disorder often leads to serious maternal and perinatal complications. The common major maternal complications being the syndrome of haemolysis elevated liver enzymes and low platelets (HELLP syndrome), abruption placentae, disseminated intravascular coagulation (DIC), pulmonary oedema, acute renal failure, eclampsia, and death.

Duley *et al* observed that most women with preeclampsia give birth without problems because

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Key words: severe pre-eclampsia, complications

of the prompt and adequate health care services they receive.³ However, severe pre-eclampsia can cause problems such as stroke, kidney failure, liver failure, and blood clotting. Though the disease has been known for many years, we still lack methods to predict and prevent pre-eclampsia and delivery appears to be the only definitive and curative treatment.

With increasing understanding of the disease process, the occurrence of maternal complications and mortalities have fallen over the last few decades in the developed countries.⁴ On the contrary, in under developed countries like Zambia, the rates of mortality and morbidity still remain very high.⁵ This is mainly due to the poor systematic follow up and early identification of pregnant mothers with risk factors for pre-eclampsia.

At the University Teaching Hospital (UTH) in Lusaka, Zambia, severe Pre-eclampsia (SPE) is one of the leading causes of emergency obstetric admissions. Anecdotal information from unpublished work reveals that not less than two pregnant women were admitted to the labour ward intensive care unit at UTH, with severe preeclampsia each day. Numerous previous studies have investigated the causes of maternal morbidity and mortality at the University Teaching Hospital. Hickey and Kasonde reviewed eighty maternal deaths occurring at the Hospital in Lusaka, from 1974-1976. The maternal mortality rate was 1.5 per 1000 births. The commonest causes of death were pre-eclampsia and eclampsia (23%), septicemia (14%), hemorrhage (13%) and ruptured uterus.⁶ In another study involving 162 women at the hospital, it also showed the large contribution of complicated hypertensive disorders of pregnancy to maternal morbidity and mortality.⁷

There still remains a dearth of knowledge of the impact of severe preeclampsia on maternal outcome

at the UTH as the few cited studies given here analyzed all causes of maternal death and refer to the period over three decades ago. It is therefore necessary to audit maternal outcomes arising from severe preeclampsia at UTH in the recent time.

This study therefore audits the occurrence of severe preeclampsia in relation to specific maternal complications arising during pregnancy, child birth and puerperium.

METHODS

This was a prospective descriptive study conducted from June to December 2017 by analysing case notes, patient registers and face-face interviews with postpartum patients admitted with severe pre-eclampsia and its complications, through the labour ward admission.

Essential statistical data were obtained from hospital registry and participant's information from patient medical file. Where necessary, participant details were clarified with a brief face to face interview. The data was entered directly onto an Excel-based, pre-designed data entry form on a pass word-protected computer lap top. Personal identifiers such as participant's name was omitted from the data set and replaced with a study number to conceal personal identity.

The data was verified, cleaned, validated and exported to SPSS for analysis.

RESULTS

175 post-partum women with complications of SPE were recorded in this study, in the six months between June and December 2017.

BASELINE CHARACTERISTICS

The age range of women was 15- 41 years.

Table 1 shows that maternal complications from severe pre-eclampsia increased with age, with more women older than 35 years (24%). Teenage women made up 11%.

Maternal Characteristics	n	%
Age		
15 - 19	19	10.9
20 - 24	33	18.9
25 - 29	40	22.9
30 - 34	41	23.4
≥ 35	42	24.0
Gravidity		
Once	55	31.4
Twice	29	16.6
More than twice	91	52.0
Marital Status		
Single	29	16.6
Married	142	81.1
Divorced	3	1.7
Widowed	1	0.6
Residence		
Low cost	143	81.7
Medium cost	30	17.1
High cost	2	1.1
Education		
None	5	2.9
Primary	54	30.9
Secondary	84	48.0
Tertiary	32	18.3
Occupation		
Unemployed	107	61.1
Employed	42	24.0
Self employed	26	14.9

The table also shows that women with higher parity (more than two) had a higher frequency (52%) of SPE in the period under review. It is likely that parity increased with age.

Married women were associated with a higher frequency of complications arising from SPE (81.1%), a finding which could be attributed to the

higher frequency of pregnancies in this category of women.

Table 1 further shows that women from the low cost residential areas, were associated with a higher frequency of complications due to SPE (81.7%). Low cost residential areas of Lusaka, are characteristically high density population communities. The Women and new Born Hospital which is the site for this study, is situated in the heart of a medium and high cost residential areas and so provides fare access to members of the surrounding community.

More women with secondary level education (48%) were associated with complication while the illiterate women had the least.

Unemployed women admitted to the hospital with SPE had the most complication of the disease.

MATERNAL COMPLICATIONS

From the 175 participants enrolled in the study, 73 (41.7%) of the women with SPE developed at least one of the complications of interest.

Figure1. Shows the various specific complications observed. HELLP syndrome and abruption of the placenta each affected 10.3% of the women. Though not necessary a maternal complication, Intra Uterine Foetal Death occurred in 28% of the women. The larger proportion of women (58.3%) however, did not suffer additional complication above SPE.

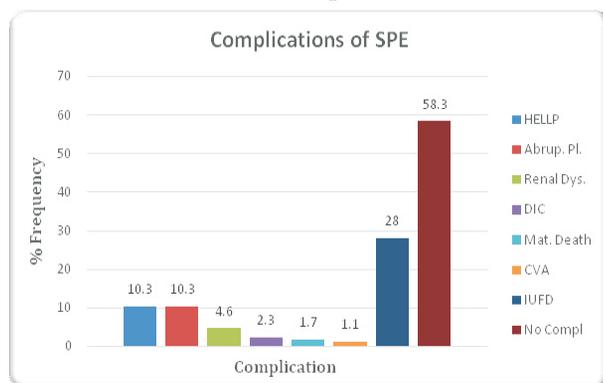


Figure 1 : Percentage frequency of complications of SPE in women from June to December 2017 at the WNBH.

DELIVERY INTERVENTIONS

Women with SPE were admitted to labour ward at different stages of pregnancy with some of them in the initial stages of labour while other remote from term and not in labour.

Figure 2 shows intervention performed in women admitted to labour ward to expedite delivery as a measure to treat SPE and its complications.

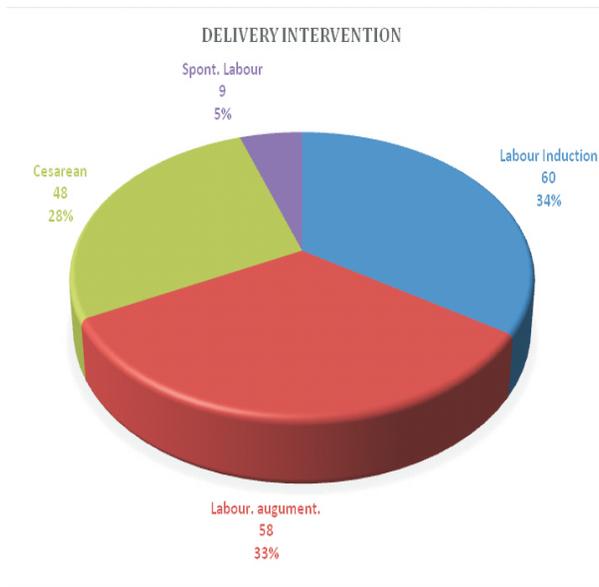


Figure 2: Delivery interventions in women admitted to labour ward with SPE.

DISCUSSION

This study has shown a series of complications that may arise from the effect of the disease process on the various body organs including the liver, kidney, uterus, the heart, the blood and other physiological systems. Furthermore, the study has shown an increase in the frequency of complications in relation to advancing age, in women with SPE. Age seems to have an important influence on the incidence of hypertensive disorders of pregnancy. This opinion was reported by Zibaenazhad *et al.* who demonstrated that young prim-gravidae less than 20 years and all patients over 30 years have had increased chance of hypertension.⁸ In this study, we see that women over 35 years were associated with

more complications. This finding compares well with the finds in a Japanese study that found women older than 45 years to have elevated risk of adverse pregnancy outcome, including hypertensive disorders of pregnancy.⁹ Advancing age often entails uncontrolled chronic hypertension which is first uncovered in pregnancy with tendency to organ dysfunction and other complications.

Prim-gravidity has often been associated with pregnancy complications including pregnancy induced hypertension and sever preeclampsia. In this study, while 31.4% of women with complications of SPE were prim-gravidae, 52% were parous women (3 and more). It is likely that multi-parous women were older and so reinforcing the effect of advancing age as an important factor.

Most women in Zambia desire to bear children while in a wedlock. The higher proportion (81.1%) of married women with Complication of SPE in this study is a reflection of the many married women over the single women (16.6%) who get pregnant. Several studies have concluded that low socioeconomic status can increase the risk of adverse pregnancy outcomes, though it remains unclear whether this negative association is attributed to inadequate prenatal care due to lack of access or is a factor of the lack of material wealth and conducive living environment that affect quality of life and subsequently health outcomes. In this study most women (81.7%) with complications came from low cost residential communities of Lusaka. Such communities are densely populated and vulnerable to periodic outbreaks of epidemic diseases. Though access to maternity health care in Zambia is at no substantial cost to the pregnant women, because government takes up the cost, immediate access to emergency care at the tertiary hospital among women from the less affluent communities can be impeded by lack of readily available transport at night and other problems. This finding is similar to the findings in the Korean study that determined that Social Economic Status (SES) can affect pregnancy outcomes even under a universal healthcare system.¹⁰

Education attainment did not seem to affect pregnancy outcome significantly though more women (48%) with complications had secondary education. Higher education attainment empowers women to make choices about their health, including maternal health care. According to the Demographic and Health Survey of 2013-14, only 8% of women have no education.¹¹ Nearly half of women have attended primary school. Forty-five percent of women have attended secondary or higher education. Two-thirds of Zambian women are literate. The low proportion of women with complications in this study is therefore down to the higher literacy levels among women in Lusaka.

Despite the reported high literacy levels among women, unfortunately unemployment remains unpleasantly high. This study has shown that 61.1% of women with complication are not in any formal employment compared to 24% who are employed. Lack of employment leads to depleted family income and threatens food security which is an important indicator of the quality of life and health status.

The study highlights complications related to vital organs' dysfunction as a result of SPE. HELLP syndrome is a serious complication in pregnancy characterized by hemolysis, elevated liver enzymes and low platelet count that occurs in 0.5 to 0.9% of all pregnancies and in 10–20% of cases with severe preeclampsia.¹² In this study 10.3% of the women had HELLP syndrome. This syndrome is currently regarded as a variant of severe preeclampsia or a complication.¹³

Similarly, complications of the placenta accounted for 10.3% of the complication of SPE in this study. Placenta abruption is associated with severe maternal morbidity and almost exclusively with foetal death in the absence of urgent interventions. It has been proposed that decidual (placental bed) occlusive vasculopathy, caused by shallow invasion of foetal trophoblasts in the decidual spiral arteries observed in preeclampsia, is the cause of abruption of the placenta.¹⁴

In this study, 5% of the women presented with renal dysfunction. Derangements in renal function tests (urea and creatinine) and diminished urine output was a prominent feature in the 15-19 year old category. A study in Brazil analyzing a series of 55 cases of renal failure concluded that AKI was a rare but potential fatal complication in obstetric patients with pregnancy-induced hypertension as the main (41.8%) cause of the condition.¹⁵

Intrauterine foetal death is a known complication of SPE. In this study foetal death affected 28% of the women. Preeclampsia developing preterm, has particularly been shown to be at higher risk for foetal death. Preeclampsia is characterized by generalized vasoconstriction and hypovolaemia, which affects foetal-placental perfusion and oxygen delivery to the foetus. Several studies have evaluated modes of delivery and neonatal outcomes in patients with SPE.¹⁶ In this study, women with SPE were admitted to labour ward at different stages of their pregnancy. Some remote from term while others at 37 completed weeks and more. Although the aetiology and progression of SPE has not been fully understood, it has been demonstrated that delivery of the foetus and the placenta is definitive to successful treatment.¹⁷ In this study 34% of women had labour induction either because they did not meet the obstetrics criteria for caesarean delivery or the pregnancies were too premature to guarantee neonatal survival after caesarean section. Induction of labour in grossly premature pregnancies was performed as a pregnancy interruption in maternal interest.

Augmentation of labour was done in 33% of women who were admitted with clinical evidence of early labour and who did not fit into the criteria for caesarean section. Women at term in latent or active phase of labour presenting with complications of SPE that would be detrimental to surgical delivery had labour augmented with ARM and parenteral oxytocin.

Twenty eight percent of the women required emergency caesarean section. Caesarean section is

the preferred mode of delivery for pregnancies between 32-34 weeks gestation at the UTH Women and New Born hospital, the site for this study. This gestation period takes into account the expected foetal weight of 1500-2000 grams which carries a good prognostic value for neonatal survival in the neonatal unit at the hospital. Caesarean section in pregnancies at term was performed in women with SPE to reduce the period of foetal exposure to the harmful effects of the disease. In contrast to this opinion, some studies have documented benefits of vaginal delivery to neonatal outcome. For example, in their study, Jacques and colleagues (cited above) concluded that in patients who develop severe preeclampsia, vaginal delivery decreased the risk of 5 min Apgar score of <7 and admission to the NICU. They further strongly recommended consideration of vaginal delivery in women with SPE.

This study shows that most complication of SPE (47: 26.9%) manifested in women at the gestation period between 30-34 weeks. It has been known for a long time that the pathology of preeclampsia initiate at the time of placental implantation but start to manifest its clinical presentation at mid pregnancy. Disease progression thereafter varies in different women on the basis of their biological variability, living environment, access to maternity care and other factors. Results of this study would suggest a peak incidence at 30-34 weeks. Thereafter there is a decline in the frequency towards term to reach a mid-term (20-24 weeks) pregnancy value post-partum.

30-34 weeks gestation is a period of foetal prematurity which cannot assure absolute neonatal survival in the NICU at this hospital. This therefore presents substantial challenges in clinical decision making regarding timing and mode of eminent delivery in the face of SPE.

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