Pregnancy Outcomes Among Women with Sickle Cell Disease at Korle-Bu Teaching Hospital, Accra, Ghana

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Abstract

Pregnancy in Sickle Cell Disease (SCD) patients is associated with increased risk of maternal and fetal mortality. The risk varies greatly in different geographical areas. The objective of this study was to determine the pregnancy outcomes among SCD patients admitted to the Obstetrics and Gynecology Department of Korle -Bu Teaching Hospital (KBTH), Accra, Ghana. Medical records of pregnant women from 2007-2008 were reviewed retrospectively. Records of 607 women were analyzed, of which 236 SCD patients were compared with 371 women without SCD. There were 17, 781 deliveries with 1.42% prevalence of SCD. The odds of eclampsia among women with SCD were 9.6 times that of comparison women (95% confidence interval [CI] = 2.72-33.99, p<0.001). Compared with women without SCD, women with SCD were less likely to have spontaneous vaginal delivery (OR = 0.26, 95% CI=0.18-0.39, p< 0.001. In this study, babies delivered by women with SCD had an increased risk of grunting respiration than other women (OR=4.4, 95% CI = 1.10-17.87, p<0.036). However, there were no significant associations with stillbirth, low birth weight, and intrauterine growth restriction in this study. SCD was associated with increased risk of eclampsia and cesarean section among pregnant women admitted to KBTH. SCDs are among the most common genetically transmitted conditions that have a worldwide distribution. Women with SCD can have a good reproductive outcome through appropriate counseling, good prenatal care and effective intervention by health care providers with a high index of suspicion for predisposing factors to adverse outcomes.

Introduction

It is estimated that about 300,000 infants are born each year with major hemoglobin disorders in Africa and more than 200,000 of these are cases of sickle cell anemia[1]. In Ghana, 16,000 babies are born each year with sickle cell disease (SCD) and about 25% of the population are carriers of the sickle trait (HbAS)[2]. Furthermore, 95% of babies with SCD die before the age of five if there are no interventions. Depending on factors that may contribute to the progression of SCD, many patients spend a lifetime with the debilitating illness, requiring frequent hospitalizations for disorders such as acute pain crises, infections, cardiac problems, renal failure, and acute chest syndrome[3,4]. However, others appear to be free of complications in spite of progressive organ damage[5].

SCD is associated with an increased risk of medical complications during pregnancy. The maternal risks include prepartum and postpartum painful crises, urinary tract infections, pulmonary complications, anemia, preeclampsia, and death[6,7]. Fetal complications include premature delivery with its associated risks, intrauterine growth restriction, fetal distress during labor, and high rate of perinatal mortality[8-10]. However, studies shows that there is significant improvement in pregnancy outcome and that women with SCD are able to complete pregnancy successfully if they are given appropriate prenatal care[5,11,12]. Unfortunately, no such improvement has yet been observed in sub-Saharan countries, which have the highest prevalence of SCD and reported rates of maternal mortality exceeding 9%[8].

Currently, the pregnancy outcomes among women with SCD in Ghana have not been evaluated. Examining the possible complications in pregnancy associated with SCD may provide insight into the management of SCD in pregnancy in this country. This study evaluates the maternal and fetal outcomes among pregnant women with SCD at Korle-Bu Teaching Hospital, Accra, Ghana compared with women without SCD. The aim of examining the contribution of SCD to maternal and perinatal outcomes among pregnant women is to understand the unique reproductive health burden of SCD on maternal and infant health in Ghana, which may provide a basis for reducing the maternal and fetal mortality there and possibly support attainment of the Millennium Development Goals (MDG).

Methods

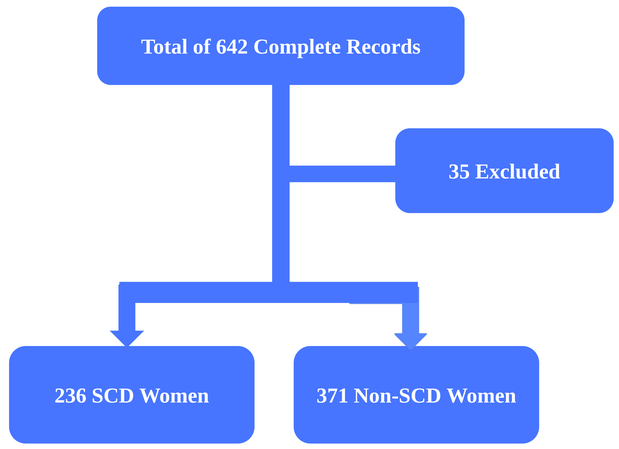
Study Area

- Retrospective study
  - January 2007 – December 2008
- Korle-Bu Teaching Hospital (KBTH)
  - Southwestern part of Accra, Ghana
  - Serves as the ultimate referral institution for patients from all over the country
- OBGYN Dept. Antenatal records of women in the obstetric and delivery room register of KBTH
  - Pre and post delivery
  - Hospital discharge data

Recruitment

- Informed consent from the prenatal outpatient clinic
  - MSM IRB & Ghana Health Service's ethical review committee standard
- SCD = SS, SC, and Sβ thalassemia.
- Preterm - <37 weeks gestational age delivery
- Low birth weight - <2.3kg.
- Inclusion criteria
  - Pregnant women with SCD
  - 18 years of age or older
  - Complete antenatal records
- Exclusion criteria
  - Less than 18 years of age
  - Co-morbidities such as malaria or HIV/AIDS
  - Multiple births
  - Incomplete antenatal records

Study Flow Chart



Results

Table 1. Characteristics of Pregnant Women at Korle-Bu Teaching Hospital 2007-2008

Variable	SCD (N=236)	Comparison (N = 371)	p-Value
Age			
Mean	29.6 5.4	28.7 5.6	0.048
18-24	41 (17.4%)	98 (26.4%)	
25-34	154 (65.2%)	203 (54.7%)	0.018
35-44	41 (17.4%)	70 (18.9%)	
Gravidity			
Primigravida	15 (6.4%)	18 (4.9%)	0.426
Multigravidae	221 (93.6%)	353 (95.1%)	
Parity			
Nulliparous	74 (31.3%)	163 (44.0%)	
Primiparous	73 (31.0%)	103 (27.8%)	0.019
Multiparous	87 (36.9%)	103 (27.8%)	

Table 2. Obstetrical Complication and Perinatal Outcomes of Pregnant Women at Korle-Bu Teaching Hospital 2007-2008

Outcomes	SCD (N=236)	Comparison (N = 371)	p-Value
Birthweight (kg)			
Mean±SD	**3.0 ± 0.7**	**2.9 ± 0.8**	**0.031**
< 2.3kg	27 (13.2%)	57(17.2%)	0.132
≥2.3kg	178 (86.2%)	275 (82.8%)	
Preterm birth	57 (24.2%)	93 (25.1%)	0.932
Stillbirth	11 (4.7%)	24 (6.5%)	0.352
Cesarean Section	**119 (50.4%)**	**72 (19.4%)**	**< 0.001**
Gestational Diabetes	**1 (0.4%)**	**40 (10.8%)**	**<0.001**
IUGR	2 (0.8%)	9 (2.4%)	0.155
Eclampsia	**17 (7.2%)**	**3 (0.8%)**	**<0.001**
Pre-eclampsia	15 (6.4%)	17 (4.6%)	0.841
PROM	8 (3.4%)	6 (1.6%0	0.156
Anemia	**125 (53.0%)**	**11 (2.9.%)**	**<0.001**
Crisis			
Vaso-occlusive	10 (4.2%)	-	
Bone	4 (1.7%)	-	

SD – Standard Deviation, IUGR – Intrauterine Growth Restriction, PROM – Premature Rapture of Membrane

Table 3. Logistic Regression Analysis of Obstetrical Complications and Perinatal Outcomes Among SCD Patients

Complications/Outcomes	Odds Ratio	95% CI	p-Value
Cesarean Section	**3.63**	**2.54-5.19**	**<0.001**
Stillbirth	0.71	0.34-1.47	0.354
LBW	0.93	0.64-1.36	0.720
Grunting Respiration	3.75	0.96-14.65	0.057
Anemia	**36.86**	**19.20-70.75**	**<0.001**
Preeclampsia	1.05	0.37-2.99	0.928
Eclampsia	**9.52**	**2.76-32.86**	**<0.001**
Preterm Labor	0.97	0.66-1.42	0.874
IUGR	2.91	0.62-13.58	0.174
Intrauterine Fetal Death	**0.12**	**0.02-0.90**	**0.039**
Gestational Diabetes	3.18	0.58-17.50	0.184
PROM	2.14	0.73-6.23	0.165

LBW – Low Birth Weight, IUGR – Intrauterine Growth Restriction, PROM – Premature Rapture of Membrane

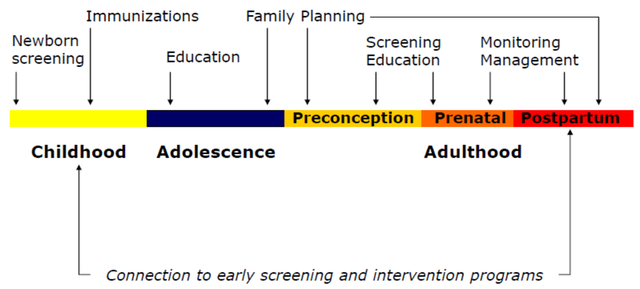
Table 4. Logistic Regression Analysis of Contributing Factors for Outcomes and Complications Among Women Delivering at Korle-Bu Teaching Hospital 2007 - 2008

Variables	Odds Ratio	95% CI	p-Value	Outcomes
	0.02	1.43 - 22.06	**0.014**	Grunting Resp.
	2.57	1.58 - 4.16	**0.001**	NICU
Gestational age <37	4.54	1.58 - 13.05	**0.005**	Pre-eclampsia
	6.55	2.29 - 18.68	**0.001**	Eclampsia
	12.02	7.60 - 19.00	**<0.0001**	LBW
Primigravida	0.21	0.05 - 0.82	**0.025**	Eclampsia
	0.12	0.05 - 0.30	**<0.0001**	LBW
Nulliparous	3.65	1.26 - 10.57	**0.017**	Still Birth

Discussion & Conclusions

- This is the first study identifying association between SCD and the occurrence of adverse maternal and fetal outcomes associated with pregnancy in Ghana.
- This study indicates that women with SCD are at significantly increased risk of eclampsia, cesarean and anemia. However SCD patients are at reduced risk of intrauterine fetal death.
- Furthermore, regardless of SCD status, nulliparous and women with gestational age <37 are at increased risk of developing pre-eclampsia, eclampsia, stillbirth and experiencing LBW deliveries.
- Surprisingly, primigravid women are less likely to develop eclampsia and experiencing LBW deliveries.
- Although there have been many remarkable improvements in the survival of women with SCD during pregnancy in the developed countries, there are significant increased risk of morbidity and mortality in the developing countries.
- Understanding the events, medical conditions, and pregnancy-related complications that women with SCD experience will allow opportunities for prevention and intervention.

Opportunities for impact: Life Course Approach



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