



**ST. PAUL'S HOSPITAL MILLENNIUM MEDICAL COLLEGE
SCHOOL OF PUBLIC HEALTH**

**SYSTEMIC LUPUS ERYTHEMATOSUS IN PREGNANCY: A CASE REPORT OF
OBSTETRIC COMPLICATIONS FROM ANTENATAL CARE SERVICE AT ST PAUL
HOSPITAL MILLENNIUM MEDICAL COLLEGE.**

BY: DR. EFRATA ZELALEM (MEDICAL INTERN)

**APRIL 2026 GC
ADDIS ABABA, ETHIOPIA**

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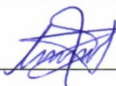
**A THESIS SUBMITTED TO GRADUATE STUDIES COORDINATING OFFICE AND ST
PAUL'S HOSPITAL MILLENNIUM COLLEGE SCHOOL OF PUBLIC HEALTH, IN
PARTIAL FULFIMENT OF REQUIREMENTS FOR BACHELOR DEGREE OF MEDICINE**

**APRIL 2026 GC
ADDIS ABABA ETHIOPIA**

Declaration

I, the undersigned student, declare that this research project is my original work in partial fulfillment of the requirement for the **Degree of Doctor in Medicine, MD**. I also declare that it has never been presented in this or any other higher institution and that all resources and materials used in the research work have been duly acknowledged.

Name of the student: Efrata Zelalem

Signature: 

Date: 26 / 03 / 2026

Approval of Advisors

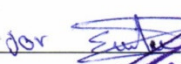
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ABBREVIATIONS

ANA= Antinuclear antibody

ANC= Antenatal care

APO= Adverse pregnancy outcome

DNA= De ox ribose nucleic acid

Ds DNA= double stranded de ox ribose nucleic acid

EULAR/ACR= European Alliance of Associations for Rheumatology and the American College of Rheumatology

IFN= Interferon

IUFD= Intrauterine fetal death

IUGR= Intrauterine growth restriction

LNMP= last normal menstrual period

SDG= Sustainable development goals

SLE= Systemic lupus erythematosus

SPHMMC= Saint Paul's Hospital Millennium Medical College

SPSS: Statistical package for social sciences

WHO= World health organization

ABSTRACT

Background: Systemic lupus erythemateous is a chronic multisystem autoimmune disease that can have a wide array of disease manifestations. The prevalence of SLE in pregnancy varies globally but is estimated to be around 6 to 30 per 100,000 pregnancies in developed countries, with higher rates reported in populations of African, Hispanic, and Asian descent. Pregnancy in women with SLE poses substantial risks, including multiple obstetric complications and maternal complications. In Ethiopia, data on the prevalence of SLE and its obstetric implications are sparse, and despite advancements in SLE management and antenatal care, maternal and fetal morbidity and mortality remain significant concerns.

Objective: To assess the prevalence of SLE and associated obstetric complications among pregnant women who received antenatal care service at SPHMMC over the past 5 years.

Methods: A cross-sectional record review study was done at St Paul Millennium Medical College on randomly selected 384 records of pregnant women who received antenatal care service in the past 5 years. The records were selected by systematic random sampling and the data was collected using a structured checklist. The collected data was cleaned, coded and feed to Statistical package for social sciences (SPSS) version SPSS 27. Analysis involved descriptive statistics using frequencies, percentages and cross tabulation.

Result: The overall magnitude of SLE was 0.3% (95 % CI: 0.008%-1.6%), which was 1 patient from 384 study participants. The study indicated that the participant with SLE had preeclampsia, preterm delivery, IUGR and IUFD which complicated her pregnancy. Further association and statistical analysis were not possible to make because of the rare occurrence of SLE among pregnant women in the study

Conclusion and recommendation: According to the study among pregnant women who have ANC follow up at St Paul hospital millennium medical college SLE is not a common occurrence despite the rising prevalence of SLE among reproductive age group women in Sub Saharan Africa. But pregnancy is not contraindicated in SLE as a result we have to optimize our pre conceptional care as well as medical follow up for women with SLE in order to maintain the lupus quiescent before, during and after pregnancy to improve the outcome of the fetus and minimize complications as much as possible.

1. Introduction

Systemic lupus erythemateous is a chronic multisystem autoimmune disease that can have a wide array of disease manifestations , including constitutional symptoms, rashes, arthritis, hematologic abnormalitis, and nephritis. The pathigenesis of systemic lupuis erythematus (SLE) remains unknown and is clearly multifactorial , many clinical manifestations are directly or indirectly mediated by autoantibodies and the immune complexes they form with antigens.

A central feature in SLE pathogenesis is the dysregulation of the innate and adaptive immune responses. Aberrant activation of dendritic cells and increased production of type I interferons (IFN- α) promote the maturation of autoreactive B and T cells. These B cells produce a variety of autoantibodies against nuclear components such as double-stranded DNA, histones, and ribonucleoproteins. The immune complexes formed deposit in tissues such as the kidneys, skin, joints, and blood vessels, leading to complement activation, inflammation, and organ damage (8,5).

It disproportionately affects women of reproductive age, with a female-to-male ratio of approximately 9:1, underscoring its significant impact on pregnancy outcomes. SLE's prevalence varies globally, with estimates ranging from 20 to 150 cases per 100,000 individuals, and a higher incidence in populations of African, Asian, and Hispanic descent. And during pregnancy prevalence of SLE varies globally but is estimated to be around 6 to 30 per 100,000 pregnancies in developed countries, with higher rates reported in populations of African, Hispanic, and Asian descent just like the nonpregnant population (4,2,6,7).

Pregnancy in women with SLE poses substantial risks, including increased rates of obstetric complications such as miscarriage, preterm birth, intrauterine growth restriction (IUGR), preeclampsia, and fetal loss. The pathophysiology of these complications is attributed to immune dysregulation, placental insufficiency, and the presence of antiphospholipid antibodies common in SLE patients (3,1).

Although advancements in diagnosis and treatment have improved the prognosis for women with SLE in developed countries, the situation remains concerning in low- and middle-income settings such as Ethiopia, where awareness, screening, and specialized care may be limited. And epidemiological studies emphasize the need for close monitoring and multidisciplinary care for pregnant women with SLE to

improve maternal and neonatal outcomes, particularly in low- and middle-income countries where data is limited and healthcare resources may be constrained (8,3,5,7).

In Ethiopia, data on the prevalence of SLE and its obstetric implications are sparse, and despite advancements in SLE management and antenatal care, maternal and fetal morbidity and mortality remain significant concerns. The absence of such data limits the ability of healthcare providers and policymakers to effectively address the specific needs of pregnant women with SLE. Without a clear understanding of the disease burden and associated obstetric complications, antenatal care programs may fail to identify at-risk women early, resulting in suboptimal maternal and perinatal outcomes (6).

This study seeks to address this critical knowledge gap by investigating the prevalence of systemic lupus erythematosus and its associated obstetric complications among pregnant women attending antenatal care at St Paul's Hospital Millennium Medical College from 2015 upto 2020. The findings are expected to contribute valuable insights for improving antenatal screening protocols, guiding clinical management strategies, and informing public health interventions aimed at reducing maternal and neonatal morbidity and mortality related to SLE in Ethiopia. Ultimately, the study supports Ethiopia's broader public health goals of reducing maternal and neonatal morbidity and mortality in alignment with the Sustainable Development Goals (SDGs) (9).

This will benefit clinicians by offering evidence-based insights in clinical decision making, hospital administrators and policymakers by highlighting the need for targeted screening and specialized antenatal care services, researchers by providing foundational data for future investigations on autoimmune diseases and maternal health and the community through improved maternal and neonatal outcomes as a result of informed health interventions

2. Literature Review

Globally the highest estimates of incidence and prevalence of SLE were in North America [23.2/100 000 person-years (95% CI: 23.4, 24.0) and 241/100 000 people (95% CI: 130, 352), respectively]. The lowest incidences of SLE were reported in Africa and Ukraine (0.3/100 000 person-years), and the lowest prevalence was in Northern Australia (0 cases in a sample of 847 people). [13] Studies from Sub-Saharan Africa report a rising prevalence, though data remain sparse and often inconsistent due to limited diagnostic resources. In Ethiopia, specific epidemiological data on SLE prevalence among pregnant women are limited, highlighting a critical gap in regional knowledge (14).

The association between SLE and obstetric complications is well documented. In Systemic lupus erythematosus and pregnancy: A retrospective single-center study of 215 pregnancies from Portugal, 2021 Nov, by Braga A, Barros T, the live birth rate was 84.2%. An adverse pregnancy outcome (APO) occurred in 41.4% of the pregnancies. A miscarriage rate of 15.3% and a preterm delivery rate of 15.4% were found. Preeclampsia and fetal growth restriction complicated 13.1% and 14.0% of the gestations, respectively. Neonatal lupus occurred in 7.1% of the newborns, and there were 2 cases of congenital heart block (10).

In Systemic Lupus Erythematosus and Pregnancy: a Portuguese Case-Control Study Sep 2021 by Braga A, Barros T pregnancy outcomes were compared between SLE patients and a group of matched healthy pregnant women. Baseline maternal data was collected, and maternal-fetal and neonatal outcomes were evaluated. One hundred twenty-four SLE pregnancies were included. Of the patients, 95.2% were in remission at conception. In 13.7% of cases, a lupus flare was diagnosed during gestation and in 17.9% in the postpartum period. The live birth rate was 84.6%, and the incidence of adverse outcomes was 40.3%. Considering only patients in remission at conception, the presence of adverse outcomes remained significantly higher (36.8% vs. 20.3). Miscarriage rate was 15.3% and preterm delivery occurred in 12.4% of the patients. Preeclampsia prevalence was higher in SLE patients. In the SLE group, the newborn admission to an intensive care unit rate was increased. No neonatal or maternal deaths were reported (11).

In pregnancy in women with systemic lupus erythematosus: a retrospective study of 111 pregnancies in Chinese women, Apr 2011 by Liu J, Zhao Y there were 23 elective, 2 spontaneous abortions, and 5 stillbirths, with 81 pregnancies resulting in live births including two multiple gestations. Three neonatal deaths were reported. Fetal loss rate including neonatal death was 11.1%. Fetal loss in active SLE group (17.0%) was significantly higher than those in inactive group (2.0%). The incidence of premature birth in active SLE group was 25/47 (53.2%), which is significantly higher than those in inactive group (3/34, 8.8%). Small for gestational age (SGA) was more common in active SLE group with incidence of 40.0% compared to 5.6% in inactive group. Five fetal malformations were recorded (6.0%), including three fetal heart malformations (one complete heart block, one tetralogy of Fallot, and one atrial septal defect) and two multiple fetal malformations, which were significantly higher than general population (12).

A number of studies showed that women with SLE are at increased risk for serious complications during pregnancy. By using the Nationwide Inpatient Sample from 2000 to 2003, Clowse compared maternal and pregnancy complications for all pregnancy-related admissions for women with and without SLE. Among patients with lupus, maternal mortality was 20-fold higher and risks for thrombosis, infection, thrombocytopenia, and transfusion were each 3- to 7-fold higher. Regarding the influence on fetal outcome miscarriages, stillbirths, neonatal death, premature delivery and intrauterine growth retardation are the most frequent adverse fetal events that can occur in lupus pregnancy (15).

In Ethiopia, antenatal care services often face infrastructural and resource limitations, potentially complicating the management of high-risk pregnancies such as those involving SLE. Understanding the prevalence and specific obstetric outcomes among this population in Ethiopia is essential for developing targeted interventions (9).

3. Objectives

3.1 General Objectives

To assess the prevalence of systemic lupus erythematosus (SLE) and associated obstetric complications among pregnant women receiving antenatal care at St. Paul's Hospital Millennium Medical College over the past 5 years.

3.2 Specific Objectives

1. To determine the prevalence of systemic lupus erythematosus among pregnant women attending antenatal care at the hospital.
2. To identify common obstetric complications associated with SLE in the study population.

4. Methodology

4.1. Study Design

An institutional based retrospective cross-sectional study was conducted.

4.2. Study Area

The study took place at St. Paul's Hospital Millennium Medical College (SPHMMC) in Addis Ababa, Ethiopia. SPHMMC is a tertiary referral hospital that provides specialized maternal and fetal healthcare, including high-risk pregnancy management.

4.3. Study Period

The study was conducted from October to December 2025.

4.4 Population

4.4.1 Source population

All pregnant women receiving antenatal care at SPHMMC over the past consecutive 5 years.

4.4.2 Study population

All pregnant women who were receiving antenatal care at SPHMMC over past 5 consecutive years and fulfilling the inclusion criteria.

4.5. Eligibility criteria

4.5.1 Inclusion Criteria

- Pregnant women of any gestational age attending antenatal care at SPHMMC in the past 5years.
- Complete charts and clinical data.

4.5.2 Exclusion Criteria

- Pregnant women with incomplete charts and clinical data.
- Women with known chronic diseases other than SLE.

4.6 Sample size determination and sampling technique

The sample size was determined by using single population proportion formula considering the following assumptions: 95% level of confidence 5% margin of error (d), which is 0.05, 50% proportion (p) since there is no previously conducted study in our population. The sample size for the study will be computed from the following formula:

$$n = \frac{Z_{\alpha/2}^2 p(1-p)}{d^2} \text{Where;}$$

D = Margin of error (5%)

P = estimated Prevalence of SLE (p)

95% confidence level and 1 – Confidence level = 1 – 0.95 = 0.05

$Z_{\alpha/2}$ – with 95 % confidence interval equal to 1.96

Where n is sample size

$$n = \frac{1.96^2 \cdot 0.5(1 - 0.5)}{0.05^2}$$

$$n = \frac{0.9604}{0.0025}$$

$$n = 384.14 \approx 384$$

4.6.1 Sampling Frame

The sampling frame consisted of the ANC registration list or appointment log of pregnant women visiting SPHMMC in the past 5 years.

4.6.2 Sampling technique

A systematic random sampling technique was used to select participants for the study. This method ensured that every pregnant woman attending ANC at SPHMMC in the past 5 years had an equal and known chance of being selected, minimizing selection bias.

- **Steps of systematic random sampling:**

1. Obtain the total number of pregnant women expected to attend ANC during the study period (N).
2. Calculate the sampling interval (k) by dividing the total population size (N) by the desired sample size (n).
3. Randomly select a starting point between 1 and k.
4. Select every k-th woman from the ANC registration list after the starting point until the required sample size is reached.

$$k = \frac{N}{n} = \frac{1707}{384} = 4.445 \approx 4$$

4.7 Study variable

Dependent variables

Systemic lupus erythematosus (SLE)

Independent variables

Age, residence, marital status, educational background, occupation.

4.8 Operational definition

SLE= Patients are classified as having SLE if they meet the ANA requirement and score a total of 10 or more points according to the 2019 EULAR/ACR criteria.

4.9 Data Collection Tools, Methods and Procedures

Data was collected through a structured checklist that is adapted and modified from previous studies. Training was given to data collectors by principal investigator over a day. The data was collected by clinical year 2 student and the principal investigator. The records were randomly selected (by systematic random sampling) among the records of pregnant women who were receiving antenatal care at SPHMMC over 5 consecutive years.

4.10 Data Management and Quality Control

To ensure the quality of data, the checklist was designed carefully. Proper training was given to data collectors, and there was close supervision of the data collecting procedure. After data collection, each information was checked for completeness and consistency. After checking for consistency and completeness, the filled checklist was entered to the SPSS 27 software.

4.11 Data Processing and Analysis

Data was be entered analyzed using SPSS version 27 statistical software package. Descriptive statistics like frequencies, percentages and cross tabulations were used to summarize data. Results are narrated and expressed in tables and pie chart after analysis.

4.12 Ethical Consideration

Ethical approval was obtained from the Health Research Ethical Review committee of SPHMMC. Permission to conduct the study was obtained from GYN/OBS department. The confidentiality of patients' information was preserved. Confidentiality was maintained by omitting any personal identification from the records and the patient's information was only used and accessed for research purpose only.

5. Result

5.1 Socio demographic characteristics

A total of 384 records were assessed in this study. The mean and SD of the women's age were 27.84 and 4.96 respectively with minimum age of 16 and maximum age of 42. 237 (61.7%) of the women were from urban area and 147(38.3%) were from rural area. With regard to marital status 378 (98.4%) were married, 5(1.3%) were single, 1(0.3%) was divorced. Most of the records were from the year 2011 with 174 records (45.3%), 86 (22.4%) from the year 2012, 64(16.7%) from the year 2010, 34(8.9%) from the year 2013, 26(6.8%) from the year 2014.

Table 5.1: Description of the sociodemographic characteristics of the pregnant women, SPHMMC,2025

		Frequency (N=384)	Column N %
Residency	Urban	237	61.7 %
	Rural	147	38.3%
Marital status	Single	5	1.3%
	Married	378	98.4%
	Divorced	1	0.3%
	Widowed	0	0%
Year of ANC follow up	2010	64	16.4%
	2011	174	45.3
	2012	86	22.4%
	2013	34	8.9%
	2014	26	6.8%

5.2 Obstetric history

Out of the 384 records, 297(77.3%) of the women were multi gravid, while 86 (22.4%) were primigravid, regarding their parity 236 (61.5%) were multiparous ,96 (25%) were primiparous and 52 (13.5) were nulliparous. 93(24.2%) had miscarriages, 29(7.6%) had a still birth and 15(3.9%) had a preterm birth. Considering the mode of delivery 172(44.8%) had a history of cesarian delivery.

Table 5.2: Obstetric history of the pregnant women, SPHMMC,2025.

		Count	Column N %
Gravidity	NG	0	0.0%
	PG	86	22.4%
	MG	298	77.6%
Parity	NP	52	13.5%
	PP	96	25%
	MP	236	61.5%
History of miscarriage	Yes	93	24.2%
	No	291	75.8%
History of still birth	Yes	29	7.6%
	No	355	92.4%
History of preterm birth	Yes	15	3.9%
	No	369	96.1%
History of CS	Yes	172	44.8%
	No	212	55.2%

5.3 Magnitude of SLE

The overall magnitude of SLE was 0.3% (95 % CI: 0.008% - 1.6%), the diagnosis was confirmed by a specialist with the diagnostic criteria of EULAR. Among the total pregnant women 99.7 % of them had no SLE.

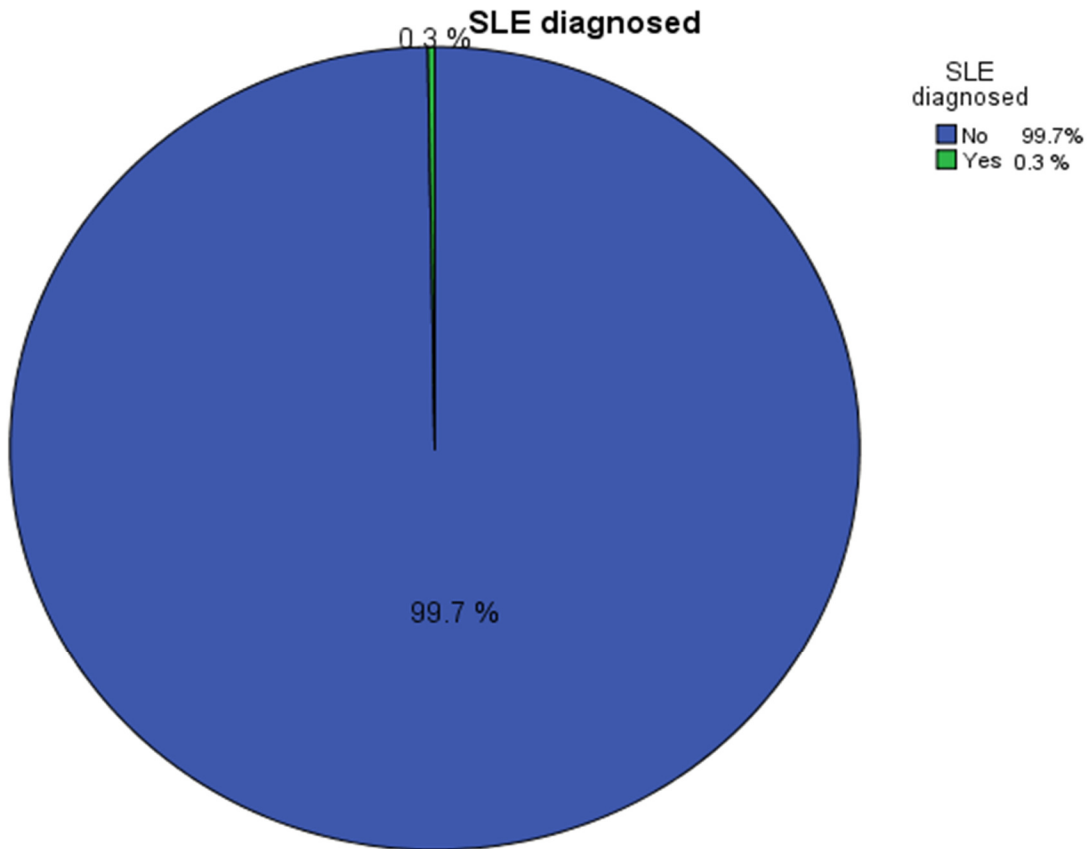


Figure 5.1. Diagnosis of SLE among pregnant women who have ANC follow up at St paul's hospital millennium medical college, Addis Ababa, Ethiopia. (N=384)

5.4 SLE and associated obstetric complications

The study indicated that the participant with SLE had preeclampsia, preterm delivery, IUGR and IUFD which complicated her pregnancy. Further association was not possible to make because of the rare occurrence of SLE among pregnant women in the study.

The patient is a 25 years old GIII PI (alive by vaginal delivery) AI (spontaneous at 2 months of gestation) female patient who did not remember her LNMP and she did not have any early milestones but she claimed to be amenorrheic for 7 months. She had a complaint of absent fetal movement of 2 days duration. She initially presented with a complaint of generalized body swelling of 2 months duration which started from the face and progressed to involve the abdomen and the lower extremity bilaterally. Otherwise, she had no other complaint.

On physical examination she had a BP record of 143/68 other vital signs are stable, she had 36 weeks sized gravid uterus with longitudinal lie, breech presentation and negative fetal heartbeat, she had a grade 2 bilateral pitting edema. Other physical examinations were unremarkable.

On investigations dsDNA was positive, ANA titer positive with quantitative of 185 AU/ml, creatinine was 0.33, 24-hour urine protein was 341mg/dl and serum albumin was 2.1g/dl, CBC and urinalysis were unremarkable. On echocardiography she had mild concentric LVH and mild pericardial effusion, on obstetric ultrasound EFW 2.6 kg with severe bilateral ventriculomegaly with head circumference of 32.16 cm and negative fetal heartbeat.

With these she had a diagnosis of 3rd trimester pregnancy + preeclampsia without severity feature + lupus nephritis + IUFD + breech presentation and she was on hydroxychloroquine 200 mg daily, Lasix 20 mg 3x daily and low dose aspirin (81 mg daily). She was then primed with trans foley catheter and misoprostol. She gave birth to a 2.5 kg male grade 3 macerated fetus. She continued the hydroxychloroquine and Lasix after birth and was linked to renal clinic for follow up.

6. Discussion

The findings of the study determined the magnitude of Systemic lupus erythematosus among pregnant women receiving antenatal care at St Paul's hospital millennium medical college, Addis Ababa, Ethiopia. According to the study the prevalence of Systemic lupus erythematosus among pregnant was 0.3% (95 %CI:0.008%-1.6%). In addition, the research has determined the proportion for SLE in pregnancy, specific for our population.

There was no study on the prevalence of SLE among pregnant women to compare to the current study. But general prevalence of SLE from studies in Sub-Saharan Africa report a rising prevalence, though data remain sparse and often inconsistent due to limited diagnostic resources (14).

The study also has given a glimpse of the complications that are anticipated in pregnancies with SLE which were preeclampsia, preterm delivery, and IUFD but further association was not possible to make because of the rare occurrence of SLE among pregnant women in the study. These findings are consistent with previously done studies, according to Clowse, inpatient Sample from 2000 to 2003, compared maternal and pregnancy complications for all pregnancy-related admissions for women with and without SLE. Among patients with lupus, maternal mortality was 20-fold higher and risks for thrombosis, infection, thrombocytopenia, and transfusion were each 3- to 7-fold higher. And regarding the influence on fetal outcome miscarriages, stillbirths, neonatal death, premature delivery and intrauterine growth retardation are the most frequent adverse fetal events that can occur in lupus pregnancy (1,15).

Moreover, similar obstetric complication in SLE pregnancies were noted in the previous studies like: A retrospective single-center study of 215 pregnancies from Portugal, 2021 Nov, by Braga A, Barros T and a retrospective study of 111 pregnancies in Chinese women, Apr 2011 by Liu J, Zhao Y (11,12)

7. Limitation of the study

A probability sampling procedure (systematic sampling) was used to select the records that were reviewed and a structured checklist was used to collect the data. Adequate training was also given to the data collector.

However, the study was not free from many drawbacks mainly, inadequate sample size which did not correspond to the rare occurrence of SLE in pregnancy which limits the generalizability of the findings. The above draw back was tried to overcome by widening the source of our population but it was not

successful. Further studies should consider larger sample size or a different study design like a case – control or cohort study design. In addition, it was difficult to assess the obstetric complications that are associated with SLE during pregnancy due the rare occurrence of SLE in pregnancy and so almost all statistical analysis was not able to be done.

Another limitation was as a retrospective record review the study is inherently limited by the accuracy and completeness of medical records.

8. Conclusion and Recommendations

According to the study among pregnant women who have ANC follow up at SPHMMC, SLE is not a common occurrence despite the rising prevalence of SLE among reproductive age group women in Sub Saharan Africa and so adequate sample should have been taken. And the obstetric complications associated with SLE are paramount as stated in the current study and previous studies but this does not mean we cannot maintain the lupus quiescent during and after pregnancy and improve the outcome of the fetus. Most importantly pregnancy is not contraindicated in SLE as a result we have to optimize our pre conceptional care as well as medical follow up for women with SLE in order for them to have a safe pregnancy and good outcome as they wish. With adequate and appropriate management of SLE we can achieve these goals. More over in subsequent studies on SLE and pregnancy larger number of sample size should be taken based on the proportion this study provides and other statistical methods.

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