SEROPREVALENCE OF SYPHILIS AT DELIVERY AT MOUNT MERU REGIONAL HOSPITAL TANZANIA

Submitted by

DR. ASHERY ARNOLD BIYOBOKE

MD, HKMU DAR

As part of fulfilment for the degree of Master of Medicine in Obstetrics and Gynaecology, UNIVERSITY OF NAIROBI

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DEDICATION

This book is dedicated to my wife Grace, children; Glory, Arnold Junior and Anna.

DECLARATION

I hereby declare that this research is my original work done under the supervision and guidance of my supervisors Dr. Omondi Ogutu and Dr Francis Odawa. This dissertation has not been submitted to any other university for a degree course.

Dr. Ashery Arnold Biyoboke

Department of Obstetrics and Gynaecology

University of Nairobi.

Signature:_____

Date:_____

SUPERVISORS' DECLARATION

This is to certify that this research has been conducted and written by Dr. Ashery Arnold Biyoboke under our close guidance and supervision and is submitted with our approval for Masters of Medicine in Obstetrics and Gynaecology.

1. Dr. Omondi Ogutu

   Senior Lecturer and Consultant Obstetrician/Gynaecologist

   Department of Obstetrics and Gynaecology

   University of Nairobi.

   Signature_____

   Date_____

2. Dr. Francis Odawa

   Lecturer and Obstetrician and Gynaecologist

   Department of Obstetrics and Gynaecology

   University of Nairobi.

   Signature_____

   Date_____

CERTIFICATE OF AUTHENTICITY

This is to certify that Dr Ashery Arnold Biyoboke , M'Med student researched upon this thesis in the Department of Obstetrics and Gynecology, University of Nairobi, under the guidance and supervision of Dr Omondi Ogutu and Dr Francis Odawa. This dissertation has not been submitted to any other University for a degree course.

PROF. ZAHIDA QURESHI,

ASSOCIATE PROFESSOR OF OBSTETRICS AND GYNAECOLOGY,

THE CHAIRPERSON DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY,

UNIVERSITY OF NAIROBI.

Signed_____

Date_____

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LIST OF ABBREVIATIONS

ANC	Antenatal care
RCH	Reproductive and Child Health
HIV	Human immunodeficiency virus
PMTCT	Prevention of mother to child transmission
RPR	Rapid plasma reagin
SPSS	Statistical package for social sciences
STI	Sexually transmitted infections
TPHA	Treponema pallidum haemagglutination assay
VDRL	Venereal disease research laboratory
WHO	World health organization
SOPs	Standard Operating Procedures
NIMR	National Institute of Medical Research
UoN	University of Nairobi
KNH	Kenyatta National Hospital
ERC	Ethics and Research Committee

ABSTRACT

Background:

In Tanzania Screening for Syphilis during antenatal care is only done once at booking. So far in Arusha region like many other regions in Tanzanian hospitals, no study has been done to establish the actual seroprevalence of Syphilis among pregnant women at term or delivery. Thus, there is a missed opportunity of being tested at delivery for those who did not attend RCH clinic and those who acquired Syphilis after they had tested negative at booking. The untreated maternal Syphilis has a significant impact on birth outcomes including congenital Syphilis although Syphilis infection in pregnancy does not affect the course of labour and delivery.

Broad objective: To determine seroprevalence of Syphilis at delivery among pregnant women at Mount Meru regional hospital Tanzania.

Study design*:* This was a descriptive cross-sectional hospital based study.

Study setting: The study was conducted in Mount Meru Regional Hospital Tanzania between July and September, 2012.

Study population*:* All pregnant women who delivered in Mount Meru regional hospital during the study period regardless of their index pregnancy and previous antenatal Syphilis screening status.

Sample size: About 97 pregnant women were recruited sequentially into the study at time of delivery and after delivery.

Methods:

Self-administered questionnaires were used. After the consent was signed by the respondent, about 4 mls of cubital fossa venous blood was collected and the sample was taken to the laboratory for analysis. RPR test was done and all positive results were confirmed by TPHA test.

Data management and analysis

The collected data was sorted and entered into Microsoft excel by Statistician. The information was then imported into SPSS statistical package version 17.0 for analysis.

The results were presented in tables and descriptive statistics. The Chi- square test was used to test the associations. The level of significance was set at 0.005

Results:

In this study the prevalence of Syphilis was found to be 3.1% (p value 0.0001). All women who were infected with Syphilis had a negative test during antenatal period this shows that there was Syphilis seroconversion of 3.1%. Women in polygamous marriage and those with multiple sexual partners were more likely to have Syphilis infection. Factors such as HIV, Socio-demographic characteristics parity, age, gestational age, antenatal profiles, occupation, and education level had no significant association with presence of Syphilis.

Limitations:

Since Mount Meru hospital is within the Arusha city**,** this study would reflect prevalence of Syphilis in urban setting and it might not reflect the real situation in rural setting.

Conclusion:

Seroprevalence of Syphilis in this study was 3.1% which was less than the National Tanzania average of 6.7%. All women who were infected with Syphilis had a negative VDRL test during antenatal period. This shows that there was a Syphilis seroconversion of 3.1%. Women in polygamous marriage and those with multiple sexual partners were more likely to have Syphilis infection.

Recommendations:

Repeat screening of Syphilis is important in late pregnancy or at delivery.

LITERATURE REVIEW

Syphilis is a sexually transmitted infection (STI) caused by bacteria Treponema pallidum. In infected pregnant women, it causes spontaneous abortion, stillbirth, preterm birth, congenital infections and also increases the risk for Human immunodeficiency virus (HIV) infection acquisition. The World Health Organization recommends screening of syphilis be done at the first RCH clinic as early as in first trimester, and be repeated in third trimester for detection of infections or re infection acquired during pregnancy and also be done during delivery for those who missed opportunity during RCH Clinic to allow early diagnosis and treatment of mother and newborn .Access to antenatal syphilis screening in most affected countries ranges between 30-38% .[1]

Syphilis is still a leading cause of perinatal mortality and morbidity worldwide despite the available and affordable methods for diagnosis and treatment in pregnant women. World health organization (WHO) estimates that 2 million pregnant women each year are infected with Syphilis globally and about 1.2 million of those infected are transmitting the infection to babies. In pregnancy, untreatable syphilis will result in stillbirth rate of 25%, neonatal death of 14% and overall perinatal mortality of 40%. The prevalence of syphilis in pregnant women in Africa ranges from 4% to 15%. And Syphilis prevalence among pregnant women in Tanzania is estimated at 6.7% [2,3,4]

Syphilis screening is an effective strategy to prevent adverse outcome of infection in pregnant women including congenital infection among newborns. It is part of an essential package of antenatal care leading to detection of more than 80% of silent infections. Screening is done by Non-treponemal specific tests mainly rapid plasma reagin (RPR) and by venereal disease research laboratory (VDRL) test. These tests detect almost all cases of early syphilis but they are liable for false positive results and misinterpretation hence a need for confirmatory test by rapid treponemal test mainly treponemal pallidum haemagglutination assay (TPHA). It takes 10-45 days for infection with syphilis to be detected by blood tests. Since an initial test does not guarantee absence of infections, it is appropriate to screen pregnant women who are negative in the first test later during pregnancy or at delivery. [5]

Maternal Syphilis is of particular concern in developing nations as it may lead to spontaneous abortion, stillbirth, death of the neonate, or disease in the infant; a recent report from Tanzania estimates that up to 50% of stillbirths are caused by syphilis.[6]

Much attention is being given to the prevention of HIV infection in babies through prevention of maternal to child transmission during pregnancy and in labour. By contrast, little concern is raised about the prevention of congenital Syphilis. Commonly, most vertical transmission of Syphilis occurs after four months of gestation, so an approach of early antenatal screening and appropriate treatment prevents most cases. [7]

The National Health policy in Tanzania promotes screening of all pregnant women during first antenatal visit in first trimester. Early antenatal screening may not be a functional and reliable strategy to control syphilis morbidity and mortality due to a large number of women attending the four antenatal clinics later than the first trimester. In recent years, World Health Organization has noted high rates of syphilis among pregnant women from several countries in Eastern Asia, the Pacific and North Africa. (Morocco 3.0%, Djibouti 3.1%, Papua New Guinea 3.5%, Cambodia 4.0% and the South Pacific Islands 8.0%). In Latin America and the Caribbean, the prevalence among pregnant women is between 1.7 and 7.0% .[8]

In European countries in spite of good health care services, there are still cases of Syphilis being reported. For example in Italy a study done in 2000-2007, positive serology for Syphilis was found in 0.49% among pregnant women delivering in Hospital. [9]

A study done in France in 2004 showed a resurgence of Syphilis. In this study six cases of congenital Syphilis were detected and mothers of the four children were diagnosed during third trimester and two of them after they had premature delivery. [10]

In Latin America, Syphilis seroprevalence was estimated at 0.27% among women delivered in hospital within Mexico (2003) and in Haiti the prevalence was found to be 7.6% .[11]

Factors independently associated with missed prevention opportunity were schooling (<8 yrs), single marital status, low income, having sex during pregnancy, history of Syphilis to current pregnancy, less than six prenatal visits and last prenatal visit before the third trimester. These high rates of non tested women in Brazil are indicative of failure in prevention and control actions for HIV and congenital syphilis. [12]

In Eastern Africa, a study in Ethiopia in women attending antenatal clinic in rural areas in 1994 showed that only 4.7% of women attended clinic in the first trimester and Syphilis prevalence was 13.7%. Past history of sexual transmitted infections was significantly associated with syphilis positivity. [13]

A WHO study in sub-Saharan Africa in 1996 reported that 73% of women received antenatal care in study countries. Of these women 38% were estimated to have been screened for syphilis, and the syphilis seroprevalence was estimated at 8.3%. This translated to approximately 1,640,000 pregnant women with undetected syphilis annually including 1,030,000, who attended antenatal care. The prevalence of syphilis in Burkina Faso in 1995 was of 2.5% among antenatal care attending women. A study done in Nigeria in 2004-2006 gave a prevalence of syphilis among pregnant women of 2.97% .[14,15,16]

In Eastern African region, a data analysis of Hospital in Entebbe, Uganda in 2002-2006 to evaluate uptake of HIV and syphilis testing of pregnant women and their male partners for prevention of mother to-child HIV transmission showed that 82.2% of women attended ANC and tested for syphilis, but only 1.1% of their male partners accepted syphilis testing and the prevalence was 4.0% for women and 6.2% for men. [17]

In Tanzania, a study done in rural areas of Manyara and Singida in 2003-2004 among pregnant women during the RCH clinics booking found that, the overall prevalence of syphilis was 1.6%. The main risk factors for Syphilis infection were multiple sexual partner and polygamous marriage.[18]

Syphilis screening tests using VDRL antigen were carried out on two hundred pregnant women attending antenatal clinic in Osogbo, the capital city of Osun State, South Estern Nigeria in 2007.

The overall prevalence of infection was 10.0%. Infection was highest (7.0%) among pregnant women in the age group 21 – 30 but there was no significant difference between age group and syphilis infection. [19]

In Tanzania, Surveillance of HIV infection and syphilis continues to provide useful information to better understanding the epidemiology of HIV and syphilis among pregnant women. The 2008 ANC Surveillance round has indicated the HIV prevalence of 7.0% and syphilis prevalence of 4.3%. This is a downward trend compared to the previous 2006 ANC surveillance round. The urban sites continue to have high HIV prevalence than the rural sites. In contrast, it is the opposite for syphilis where the prevalence is higher in rural areas. [20]

In the study done in Ethiopia in 2003- 2007 among blood donors, showed the prevalence of syphilis to 1.3% of whom 38% had co infection with HIV. A similar trend was observed in same country in 2005, the prevalence of syphilis was 1%. [21]

A case control study done in china in 2007 to investigate factors associated with recent syphilis infection among pregnant women and recommend strategies for improved preventive interventions in the community found that Syphilis was significantly associated with unmarried status, less education, multiple sex partners, travel of sex partner in the past 12 months, a history of induced abortion, and previous sexually transmitted infections. There were no significant differences between cases and controls in age, occupation, residence status and monthly income. This was similar to findings recorded by Urassa et. al 2001 that women who were fully supported by their male partners were at a reduced risk of active syphilis compared with those with their own personal income source. [22,23]

A hospital based cross sectional study done in Zimbabwe in 2005 to evaluate risk factors and outcomes of syphilis during pregnancy women who provided blood samples, 4.8% were RPR positive. Approximately 2.2% of study subjects were RPR positive and TPHA negative. Notably, 2.5% of the population was RPR and TPHA positive at the time of giving birth. Older women had a higher risk of having positive syphilis status ($p = 0.057$). Increases in parity and gravidity were significantly associated with increased risk of syphilis infection.

Prior stillbirths were associated with an increased risk of syphilis infection (odds ratio [OR], 3.4; 95% CI, 1.61 to 7.37; $p = 0.001$). Syphilis positive mothers were significantly more likely to give birth to syphilis positive newborns ($p < 0.0001$). [24]

STUDY JUSTIFICATION

It is recommended by WHO that syphilis screening be done at the first antenatal care (ANC) as early as in first trimester and screening should be repeated in third trimester for detection of infections and re infection after booking at RCH clinic. Screening should also be done at delivery for those who missed opportunity during antenatal screening to allow early diagnosis and treatment of newborn. However repeat screening of pregnant women at term is not done in Tanzania as a result, some women seen in the first two trimesters and get infected and those who miss the screening during pregnancy are never screened**.**

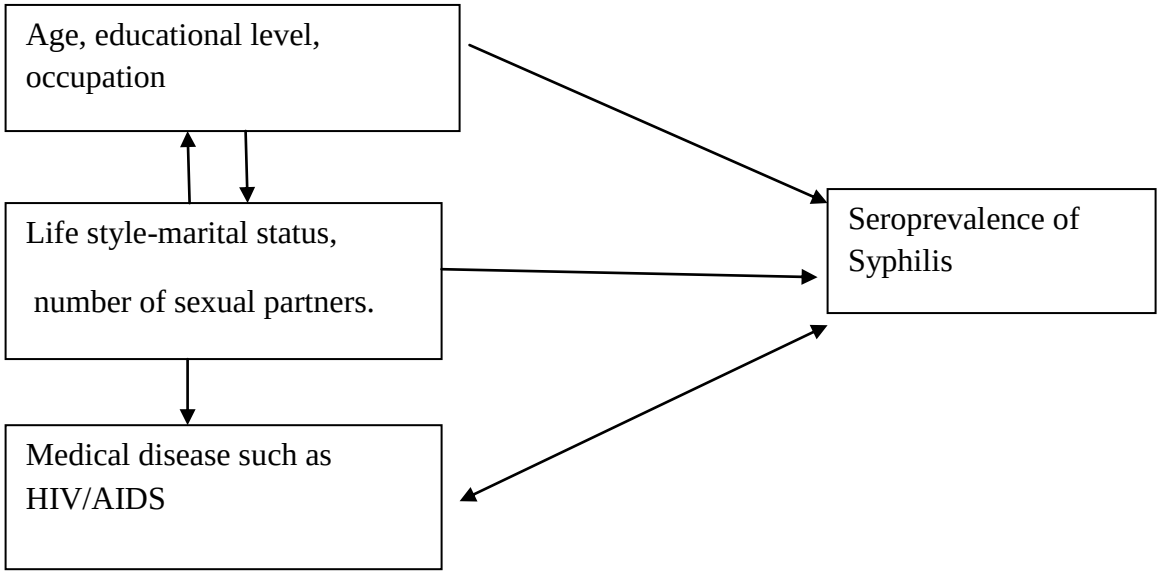
This is a missed opportunity.

This study aimed to determine the prevalence of syphilis at delivery in Mount Meru regional hospital and the results obtained from this study may be used by Policy makers in Tanzania to address the issue of improving maternal health and reducing perinatal morbidity and mortality from syphilis.

CONCEPTUAL FRAMEWORK

The aetiology of syphilis is determined by multiple factors which include social, lifestyle and demographic characteristics.These factors are usually interdependent in most cases. Social factors which may directly affect human lifestyle such as education level, marital status and help determine aetiology of syphilis because they may directly or indirectly lead to syphilis infection. Lifestyle factors such as occupation, marrital status and number of sexual partiners can directly or indirectly influence the transimission and acquisition of syphilis infection.

Some other factors are related to personal characteristics such as age, gender social class, level of education and the like which are grouped as demographic factors. These factors are self reported functional status and show the significance of social support hence explanation of how they may lead to syphilis. Medical factor such as HIV/AIDS disease can be directly or indirectly associated with the syphilis infection thus the presence of HIV may aid transmission of syphilis in a susceptible individual.



RESEARCH QUESTION.

What is the seroprevalence of syphilis among women delivered at Mount Meru regional hospital Tanzania?

OBJECTIVES.

Broad Objective

- To determine seroprevalence of Syphilis at delivery among pregnant women at Mount Meru regional hospital Tanzania.

Specific Objectives

- To determine seroprevalence of Syphilis among women at delivery.
- To determine risk factors associated with syphilis among pregnant mothers.

METHODOLOGY

Study design

This was a descriptive cross-sectional hospital based study.

Study area

The study was conducted in Mount Meru Regional Hospital situated in northern part of Tanzania. According to the Healthcare delivery system of Tanzania, this hospital is a 2nd level referral hospital. It serves 18 other smaller district hospitals scattered all over the region. At present the hospital has a bed capacity of 450 beds. It serves the residents of Arusha and other visitors who come to Arusha for various reasons including meetings, business and Tourists. There are several clinical departments which include obstetrics and gynaecology, internal medicine, paediatrics, surgery, Radiology, Pathology, Laboratory, Mental health, Dentistry, Ophthalmology, Pharmacy, and Physiotherapy. This study was done in labour ward and post natal wards.

Study population

All pregnant women who delivered in Mount Meru regional hospital during the study period regardless of their index pregnancy previous antenatal syphilis screening status.

Inclusion criteria

- All pregnant women admitted in Mount Meru regional hospital labour ward during study period who consented to participate in the study.

Exclusion criteria

- Women who were mentally sick.
- Pregnant women who had been on penicillin antibiotics two week prior to their admission in labour ward.

Sampling method

Consecutive sampling method was employed.

Patients were informed about the study and those who agreed to participate were enrolled into the study.

All women who consent to participate in the study were recruited until the required sample size reached.

Sample size estimation

Sample size of this study (n) was calculated using Kish and Lisle method (1965). The prevalence of Syphilis in Tanzania is 6.7% (5)

$$n = \frac{z^2 p (1-p)}{d^2}$$

Where:

n= sample size

z = Z score for 95% confidence interval = 1.96,

p = prevalence,

d= tolerable error =5%

p=A proportion of 6.7%

$$n= \frac{1.96^2 \times 0.067(1-0.067)}{0.05^2}$$

=97

The minimal sample size was 97 participants.

Data collection methods

After the patient has been admitted in labour ward by the Clinician/ Midwife she was approached by trained Researcher assistant to conduct the study.

The researcher assistants introduced themselves stated the purpose and benefits of the study, described the procedure involved if she agree to participate in the study. Research assistant described risks and discomfort regarding the RPR test.

Researcher assistant also stated to the patient that there will be no compensation and participation is voluntary, if she declined to participate in the study, access to services will not be denied and she was free to withdrawal from the study at any time.

Participants were assured of confidentiality at all time. Those who agreed to participate in the study were given Kiswahili consent to read and fill. Patients who were not in advanced labour were recruited into the study after they consented while those patients who were admitted in advanced labour got recruited after delivery.

The research assistant used a self administered structured, pretested and piloted questionnaire to consented patient. Information recorded was about the socio-demographic characteristics, obstetric history such as gravidity, parity, HIV status, RCH Clinic attendance, screening and treatment for syphilis, age of pregnancy in weeks, age of pregnancy at initial RCH attendance and number of RCH clinics attended in the entire pregnancy. RCH cards were reviewed to confirm all information given by the patient.

After collection of the above information the research assistant collected blood specimen from patients which was taken to the laboratory for analysis and results communicated to the patient before she was discharged. Patient and spouse who had Syphilis infection were treated with Benzathine penicillin 1.2 MU at each buttock once weekly for two weeks.

Sample collection

After obtaining informed consent, 4 mls of cubital fossa venous blood was collected, placed in a plain sterile bottle and then was transported to the laboratory for RPR testing. Positive test was confirmed by TPHA test. The procedures for sample collection, handling, processing and testing was done according to the Standard Operating procedures (SOPs) NIMR as follows:-

RPR Procedure:-

- Placed reagent and specimens to room temperature and recorded the sticker number of the specimen onto the bottle and results template.
- Pipettes 50 microlitres of specimen onto the Formica sheet. Added 16 microlitres of RPR antigen to the sample and the mixed with the antigen and sample with an applicator stick.
- Rotated the test card for 8 minutes using an automatic rotator, set at 100 rpms and read immediately after 8 minutes.

Results:

- The definitive clumping (aggregation) observed in 3 samples indicating a positive RPR test.
- 94 Test samples had no aggregation and were recorded as negative.
- The 3 positive RPR test were confirmed by TPHA test done as follows:-

TPHA procedure:

This was done to 3 RPR positive samples as follows:

- Pipettes 100 microlitres of each sample diluents into well number 1, 2, 3 and 25 microlitres into wells 2 to 4 of each sample.
- Countercheck the sticker number of specimen generated by LIMS on the results template.
- Added 25 microlitres of specimen into well number 1, 2, 3 and Mix thoroughly.

- Transferred 25 microlitres from well number 1 titrating up to well number 4 of each sample.
- Discarded the last 25 microlitres. Added 25 microlitres of unsensitised particles to well number 3 and 25 microlitres of sensitized particles to well 4 of each sample.
- Mixed thoroughly for 30 seconds using an automatic shaker. Covered the plate and left at room temperature for 2 hours before reading.

Results:

- Sample plate was placed onto a light box. The particles formed a large ring with a rough outer margin to all RPR positive samples.
- All 3 samples were TPHA positive.

Data management and analysis

- The collected data was sorted and entered into Microsoft excel by Statistician
- The information was then imported into SPSS statistical package version 17.0 for consistent checks, data cleaning and analysis.
- Results were presented into percentages for categorical variables and mean ± standard deviations at 95% confidence level.
- The chi-square test was used to test statistical significance and corresponding P values were reported.

Quality control

- Two laboratory technicians performed serological tests to ensure adherence to SOPs.
- Each test had a known positive internal control according to SOPS.
- Principal investigator reviewed data from questionnaires and results from the laboratory for consistence and completeness of responses.
- Data entry was done by two data clerks to ensure accuracy.

Study limitations

This study was done in Mount Meru regional hospital which is situated in Arusha city.

The study would not represent community prevalence unless all pregnant women delivers in Mount Meru hospital.

Ethical Clearance and approval

- The study was done after the approval by Kenyatta National Hospital and University of Nairobi Ethical and Research Committee (KNH/ UoN ERC).
- Obtained a letter from The Chairman of Obstetrics and Gynecology University of Nairobi introducing me to the Medical officer in charge of the Mount Meru regional hospital Tanzania.
- A written and informed consent was obtained before clients participate in the study. No client were forced, coerced or offered financial inducements to influence their choice to participate in the study.
- Clients who participated in the study were assured of good services as any other clients.
- The process of specimen collection was not harmful to the clients.
- All information obtained from clients was handled with utmost confidentiality.
- Names were not used and the numbers appeared on the questionnaire was for the purpose of study only.
- Results of the test were communicated to the patient before discharge.
- Patients who had Syphilis infection were treated with Benzathine penicillin 1.2 MU at each buttock weekly for 2 weeks. Treatment commenced before discharge.

RESULTS

This study was conducted from July to September 2012. A total of ninety seven (97) women were interviewed. The results are presented.

Table 1: Distribution of the mothers by age groups.

AGE (YEARS)	n=97	PERCENTAGE
15-19	21	22
20-24	30	31
25-29	26	27
30-34	15	15
35-39	4	4
40+	1	1
TOTAL	97	100

The age distribution of the participants was 15 to 40 years with a mean of mean age of 22 years. The modal age group was 20-24 years. Twenty two (22) percent of the study group were teenagers.

Table 2: Socio-demographic characteristics of respondents.

Characteristic	n=97	%
Marital status		
Monogamous	90	92.6
Polygamous	2	2.2
single	5	5.2
Education level		
Primary	51	52.6
Secondary	33	34.0
Vocational/College	13	13.4
Occupation		
Unemployed	32	30.0
Self employed	47	48.5
Salaried employment	18	18.6
Occupation of spouse		
Unemployed	2	2.1
Self employed	64	66.0
Salaried employed	31	32.0

About ninety three percent (93%) of the study participants had monogamous marriage, 5.2% were single and 2.2 % had polygamous marriage. About 49 % of the study participants were self employed, 30% were unemployed, 18.6% had salaried employment while 3.1% were students.

Table 3: Antenatal profile of women during RCH clinic

ANC Profile	Number	Percentage
Attended RCH Clinic		
NO	1	1
YES	96	99
Number of RCH visits		
1-4	90	94
>4	7	6
Tested for Syphilis during current pregnancy		
No	10	10.3
YES	87	89.7
VDRL results		
Negative	87	100.0
Spouse tested for Syphilis		
No	87	100.0
Tested for HIV during RCH clinic		
NO	2	2.1
Yes	95	97.9
HIV results		
Negative	96	98.9
Positive	1	1.1

In the study group, 99% of women attended RCH clinic while 1% did not attend at RCH clinic. About 90 % of the study participants were tested for syphilis during RCH clinic and all had negative VDRL test, while 10 % were not tested. In the study group there was no spouse tested for syphilis. About 99% of respondents were HIV negative during RCH care.

Table 4: The past sexual and obstetric history of respondents.

Past sexual/obstetrics	Number	percentage
Parity		
1	70	71
2	11	12
3	11	12
4+	5	5
Number of sex partners in the last Two Years		
1	95	98
2	2	2
Number of children born dead after 7 month of pregnancy		
None	96	99
1	1	1
Number of pregnancies lost before 7th month of pregnancy		
None	89	91.8
1-2	7	7.2
3+	1	1

About 98% of the respondents had one sex partner while 2% of the study participants had 2 sex partners in the last 2 years. Regarding parity of the study participants 71% had conceived once while 5.2% of the study participants had conceived more than four times. Ninety nine percent (99.0%) of the study participants had children who were born alive after seven month of pregnancy.

Table 5: Study findings for women who tested for RPR and TPHA

Study findings	number	percentage
RPR Negative RPR positive	96 3	96.9 3.1
TPHA Positive	3	100.0

In this study 3.1% of the study participants had Positive RPR test while 96.9% had a negative RPR test. TPHA test was positive to all 3 RPR positive tests.

Table 6: Comparison between RPR/TPHA results and marital status, number of sex partners of women in the study.

Study findings of Syphilis results	Positive RPR/TPHA	Negative RPR/TPHA	P value
Marital status			
Monogamous	1 (1.1)	89 (98.9)	<0.0001
polygamous	2 (100.0)	0 (0.0)	
Number of sex partners in the last 2 years	1 (1.1) 2 (98.9)	94 (98.9) 0 (0.0)	<0.0001

Table 6 shows that respondents who had syphilis had marital status of monogamous 1.1 % and polygamous marriage 100.0 % (P value < 0.0001) this was statistically significant.
Number of sex partner in respondents who had syphilis in monogamous group was 1.1 % and in polygamous marriage were 2 (100.0%) with P value < 0.0001 this was statistically significant.

Table 7: Comparison between ages, gestational age at delivery, Vs RPR/TPHA results.

Variable	RPR/TPHA	Number	Mean	Std. Deviation	P value
Age	Positive	3	29.67	8.622	0.073
	Negative	94	24.09	5.149	
Gestational age at delivery	Positive	3	40.33	.577	0.673
	Negative	94	40.07	1.050	

Table 7 shows that the mean age of respondents with positive syphilis test was 29.67 with standard deviation of 8.622. This shows that age factor was not statistically significant in this group. (P value 0.073). The mean gestation age at time of delivery was found to be 40.07 weeks in the respondents who had syphilis with p value 0.673 this was not statistically significant.

Table 8: Comparison between educational level and Occupation Vs RPR/TPHA results.

Study findings of Syphilis results	Positive RPR/TPHA	Negative RPR/TPHA	P value
Education level			
Primary	2 (3.9)	49 (96.1)	0.912
Secondary	1 (3.0)	32 (97.0)	
Vocational/college	0 (0.0)	13 (100.0)	
Occupation			
Unemployed, looking for work	0 (0.0)	9 (100.0)	0.369
Unemployed, not looking for work	2 (10.0)	18 (90.0)	
Self employed	1 (2.1)	46 (97.9)	
Salaried employment	0 (0.0)	18 (100.0)	
Student		3 (100.0)	
Occupation of spouse			
Unemployed, not looking for work	0 (0.0)	2 (100.0)	0.968
Self employed	2 (3.1)	62 (96.9)	
Salaried employment	1 (3.2)	30 (96.8)	

Table 8 shows that education level of women, occupation and occupation of the spouse were not statistically significant in relationship to syphilis infection (P value >0.005).

Table 9: Comparison between past obstetric history and Syphilis test results.

Study findings of Syphilis results	Positive RPR/TPHA	Negative RPR/TPHA	P value
Number of times conceived			
One	1 (1.8)	56 (98.2)	0.206
Two	0 (0.0)	12 (100.0)	
Three	1 (9.1)	10 (90.9)	
Four	0 (0.0)	11 (100.0)	
4+	1 (20.0)	4 (80.0)	
Number of children born alive after 7 month of pregnancy			
one	1 (1.4)	69 (98.6)	0.023
Two	1 (9.1)	10 (90.9)	
Three	0 (0.0)	10 (100.0)	
Four	1 (33.3)	2 (66.7)	
4+	0 (0.0)	2 (100.0)	
Number of children born dead after 7 month of pregnancy			
None	3 (3.1)	93 (96.9)	0.857
One	0 (0.0)	1 (100.0)	
Number of pregnancies lost before 7th month of pregnancy			
None	2 (2.2)	87 (97.8)	0.166
One	1 (20.0)	4 (80.0)	
Two	0 (0.0)	2 (100.0)	
Three	0 (0.0)	1 (100.0)	

Table 9 shows that parity and previous obstetric history was no association with syphilis infection (p value >0.005).

DISCUSSION

This was a cross sectional study carried out in Mount Meru regional hospital in Arusha Tanzania, to determine the seroprevalence of Syphilis infection at delivery in the hospital. Ninety seven (97) women who delivered in the hospital were recruited into the study over a 3 month period. Syphilis infection among the pregnant women in Tanzania has been reported to be 6.7%. [2,3,4]

Seroprevalence of syphilis in this study was 3.1% which was less than the National Tanzania average of 6.7%. Women who were infected with Syphilis had a negative VDRL test during antenatal period this shows that there was a seroconversion of 3.1%. This low prevalence could be due to urban and regional variation in prevalence of syphilis (20, 21). But these findings are consistent to a similar study done in Nigeria in 2006 that reported a prevalence of 2.9% [4].[14,15,16]

Many factors have been associated with increased sexually transmitted infections especially in pregnancy. This study found that, of the three respondents who had Syphilis two of them were in polygamous marriage and they had more than two sex partner in last 2 years (P value < 0.0001). This was statistically significant. These findings are consistent to a the previous findings by study done in Tanzania, BMC infectious Disease 2008 which reported that multiple sex partners is a predisposing factor to syphilis infection. [18]

In this study there was no strong relationship between age of respondents and syphilis infection. Mean age was 29.67 with standard deviation of 8.622 with the (P value 0.073). Similar findings were reported by `a study done in Nigeria 2007 that there was no significant difference between the age group and syphilis infection. [19]

Syphilis infection in pregnancy is associated with number of complications such spontaneous abortion, stillbirth, preterm birth and congenital syphilis infection. This therefore necessitates the need to determine Syphilis infection earlier during pregnancy and appropriate treatment given to the mother and preferably the couple to prevent complications associated with congenital syphilis. In this study there was no difference in neonatal outcome at birth between the mothers who were found to have syphilis compared to the non infected mothers, although it has been reported in previous studies that there is increased still birth and neonatal death to the neonates born to mothers infected with syphilis. [3,6,10]

However, the study did not follow up the babies to determine if they would develop any complications later on in life.

In this study it was found that about 96% of respondents attended RCH clinic. Ninety percent (90 %) of pregnant women were tested for syphilis and were all negative. These findings are more encouraging compared to the WHO (1996) report in sub-Saharan Africa that 73% of pregnant women attended antenatal care in study countries. Of these women only 38% were estimated to have been screened for syphilis, and the syphilis seroprevalence was estimated at 8.3%. [12,14]

Syphilis screening is a part of an essential package of antenatal care leading to detection of more silent syphilis infections. In this study about 90% of women were screened for syphilis during RCH clinics and they were found to be negative.

The study revealed that no strong relationship between parity and syphilis infection. Of the three participants who had syphilis were para one, two and four respectively. This was not statistically significant (P value 0.206), although these findings differ from the study done at Harare maternity hospital in 2005 which reported that high parity was associated with high syphilis prevalence. [24]

In this study three respondents who were found to have syphilis infection had a negative HIV test during RCH visits, this shows that there was no strong relationship between syphilis infection and HIV. However a study done at Gondar University teaching hospital in 2007 reported that the prevalence of syphilis was 1.3% of which 38% had co infection with HIV. [21]

In this study there was no statistical significant association between the educational level, occupation of women, spouse occupation and presence of syphilis infection. It was notable that those with syphilis infection had primary level of education and were not employed. However, these findings are consistent to the study done in China (2007) by Hua Zhou and that syphilis was strongly associated with low education level and low income. [20,22,23]

The major limitation in this study was the use of RPR test which has been reported to be associated with false positive results.

This was minimized by a confirmatory (TPHA) test done to all positive RPR results which is more sensitive and specific.

Findings in this study are consistent to previous similar studies done elsewhere across the world, however, as a part of an essential package of antenatal care leading to detection of more silent syphilis infections, these results can be used in urban and peri urban setting to achieve the goal of effective strategy to prevent adverse outcome of syphilis infection in pregnant women including congenital syphilis among newborns.

CONCLUSIONS.

1. Seroprevalence of syphilis in this study was 3.1% which was less than the National Tanzania average of 6.7%.
2. All women who were infected with Syphilis had a negative VDRL test during antenatal period.
3. Women in polygamous marriage and those with multiple sexual partners were more likely to have Syphilis infection.

Recommendations

Repeat screening of Syphilis is important in late pregnancy or at delivery.

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25: Standard operating procedure for RPR/ TPHA

NIMR MWANZA TANZANIA TO11&13

APPENDICES

I: SEROPREVALENCE OF SYPHILIS AT DELIVERY IN MOUNT MERU REGIONAL HOSPITAL TANZANIA

RESPONDENT QUESTIONNAIRE

STUDY NUMBER									
DATE OF THE INTERVIEW	dd-mm-yyyy					2	0		

A. SOCIAL DEMOGRAPHIC FACTORS

101	Age in completed years	
102	What is your marital status? 1. Married (Monogamous) 2. Married (Polygamous) 3. Single 4. Widowed 5. Cohabiting 6. Divorced/ separated	
103	Have you ever attended school? 1. Yes 2. No	
104	If yes what is the highest level of school attended? 1. Primary 2. vocational 3. Secondary 4. College 5. University	
105	What is your occupation? 1. Unemployed, looking for work 2. Unemployed, not looking for work 3. Self employed 4. Salaried employment 5. Casual laborer 6. Sick/disabled and unable to work 7. Student 8. Other (specify .....…… ……)	
106	What is your husband/Spouses occupation? 1. Unemployed, looking for work 2. Unemployed, not looking for work 3. self employed	

	4. salaried employment 5. casual laborer 6. sick/ disabled and unable to work 7. student 8. other (specify - ……)	
107	Number of sexual partner in the past 2 years 1. one 2. Two 3. Three 4. Four 5. More than 4	

B: PAST OBSTETRIC HISTORY

201	How many times have you conceived? 1. First time 2. One 3. Two 4. Three 5. Four 6. More than four	
203	How many children born alive after 7^{th} Month of pregnancy? 1. One 2. Two 3. Three 4. Four 5. More than Four	
204	How many children born dead after 7^{th} Month of pregnancy? 1. None 2. 1 3. 2 4. 3 5. 4 6. More than 5	

C. ABOUT THE CURRENT PREGNANCY

301	When was your Last Normal Menstrual Bleeding (LNMP) __ __, __ __, __ ___ __ ___	
302	Gestational Age in weeks at Delivery__ __ To be Calculated by Researcher assistant	
303	Did you attend RCH Clinic during this pregnancy? 1. Yes 2. No	
304	If YES, where did you receive RCH care for this pregnancy? 1. Dispensary 2. Health Centre 3. Hospital 4. Others (specify ....)	
305	How many weeks was your pregnancy at RCH Clinic booking ___ ___ (To be obtained from her RCH card)	
306	How many RCH visits did you attend during this pregnancy? 1. One 2. Two 3. Three 4. Four 5. More than Four	
307	Were you tested for Syphilis during Current pregnancy at RCH clinic? 1. YES 2. NO	
308	If NO skip to question number 312	
309	If YES what was the results 1. POSITIVE 2. NEGATIVE	
310	If POSITIVE were you treated? 1. YES 2. NO	
311	Was your husband/ spouse treated? 1. YES 2. NO	

312	Were you tested for HIV during RCH clinic? 1. YES 2. NO	

313	If YES what was the results? 1. POSITIVE 2. NEGATIVE	

D. STUDY FINDINGS

401	1. SYPHILIS TEST NEGATIVE 2. SYPHILIS TEST POSITIVE	
402	1. TPHA TEST NEGATIVE 2. TPHA TEST POSITIVE	

END

II: CONSENT FORM FOR INTERVIEWEES

SEROPREVALENCE OF SYPHILIS AT DELIVERY IN MOUNT MERU REGIONAL HOSPITAL TANZANIA.

Principle investigator: Dr Ashery Arnold Biyoboke

Introduction

Dr. Ashery Arnold Biyoboke of the Department of Obstetrics and Gynecology, University of Nairobi, is conducting a study on Seroprevalence of Syphilis at delivery in Mount Meru Regional Hospital Tanzania.

Purpose

The study will be to determine the seroprevalence of syphilis at delivery among pregnant Women in Mount Meru regional hospital Tanzania. This will help us to know the current burden of syphilis among pregnant women and the information obtained may be used to improve the quality of Reproductive Health care in Mount Meru Regional Hospital.

Procedure

If you agree to participate in the study you will be asked questions after you have been attended to by the doctor/Midwife. The nature of the questions will be about your past and present pregnancy. The interviewer will also access your antenatal card to identify whether the syphilis test was done if it was not done the test will be offered. Results will only be shared with your attending clinician and you as part of the management with confidentiality being maintained. The questionnaires where this information will be filled will be removed identifiers to protect your confidentiality.

Risks/Discomfort

This study will involve doing a RPR test to detect Syphilis infection, this will involve a needle prick to obtain 4 mls of blood. During this procedure you may experience some pain but this is minimal. You will also be asked questions which may cause psychological discomfort. You are free not to answer any such questions if you feel so. In addition, the questions will also be asked in a private environment and confidentiality will be assured at all times to ensure your comfort.

Benefits

In case you are found to be syphilis positive you and your baby will be appropriately referred to the clinician for treatment to improve your health. This will help us to know the current burden of syphilis among pregnant women and the information obtained may be used to improve the quality of Reproductive Health care in Mount Meru Regional Hospital.

Confidentiality

Your confidentiality will be maintained at all times. The questionnaires will not have any names but will be assigned Identifiers which will be assigned randomly. The filled questionnaires will be stored in a lockable filing cabinet only accessible to the principle investigator and research assistant. Electronic data will be stored in a password protected database accessible only through the principle investigator .The analysis and report of the study will only use the study numbers and no detail will be provided at any point that might identify an individual. There shall be no mention of names or identifiers in the report or publications which may arise from the study. The information obtained will be used only for the purpose of the study

Compensation

There will be no compensation for participation in the study.

Voluntariness

Participation in the study is voluntary. If you choose not to participate, you will not be denied any service. You will be free to withdraw from the study at any time.

Your participation in the study will be highly appreciated.

I_____ hereby voluntarily consent to participate in the study. I acknowledge that a thorough explanation of the nature of the study has been given to me by Dr/Mr./Mrs._____. I clearly understand that my participation is completely voluntary.

Signature _____ Date_____

Signature of

Reseacher/Assistant_____Date_____

Contacts

If you have any questions regarding the study, you can contact Dr Ashery Arnold Biyoboke through telephone number +255 784 593 880 and +254 719 109 300

In case of any ethical concerns please contact

KNH/ UON-ERC

PO BOX 19676 Nairobi (code 00202)

Telephone number (254-020)2726300 Ext 44355

KISWAHILI : FOMU YA RIDHAA.

PREVALENSI YA UGONJWA WA KASWENDE KWA AKINA MAMA WAJAWAZITO WAKATI WA KUJIFUNGUA KWENYE HOSPITALI YA MKOA MOUNT MERU TANZANIA

MTAFITI MKUU: **Dr. Ashery Arnold Biyoboke**

UTAMBULISHO

Kwa majina naitwa **Dr. Ashery Arnold Biyoboke** kutoka chuo kikuu cha Nairobi, Idara ya Uzazi na Magonjwa ya akina mama. Hili ni ombi kwako ukubali kushiriki katika utafiti. Lengo la fomu hii ya ridhaa ni kukufahamisha yale utakayohitajika kujua ili kukusaidia kuamua kushiriki katika utafiti.Tafadhali isome fomu hii kwa makini.Unaweza kuuliza maswali kuhusu yale utakayo hitajika kufanya, athari zozote, manufaa na haki zako kama mshirika

LENGO NA MANUFAA YA UTAFITI

Utafiti huu unalenga kujua ukubwa wa tatizo la ugonjwa wa Kaswende kwa akina mama wajawazito Wakati wa kujifungua kwenye hospitali ya Mkoa Mount Meru Tanzania. Pia matokeo ya utafiti huu yataweza kusaidia kuboresha huduma kwa akina mama wajawazito wanapohudhuria kliniki ya akina mama wajawazito kwenye hospitali ya Mkoa Mount Meru Tanzania.

TARATIBU ZITAKAZO FUATWA

Endapo utakubali kushiriki kwenye utafiti huu, utaulizwa maswali mara baada ya kuhudumiwa na Daktari/ Muuguzi Mkunga. Maswali utakayo ulizwa yatahusisha ujauzito wote wa awali na ule wa sasa. Mtafiti msaidizi atakagua kadi yako ya kliniki ili kujua kama Wakati wa kliniki endapo ulipimwa ugonjwa wa Kaswende au la. Ikiwa haukupimwa utaweza kupimwa

wakati wa utafiti huu. Ukikubali kushiriki kwenye utafiti huu utapewa majibu ya uchunguzi wa kipimo kilichochukuliwa na usiri utazingatiwa wakati wote na pia endapo kuna sababu ya kumshirikisha Daktari usiri utazingatiwa **.**Nambari maalum itatumika kukutambulisha badala ya majina yako.

MADHARA, MATATIZO, NA ADHA

Utafiti huu utaambatana na upimaji wa ugonjwa wa Kaswende, ambapo kiasi cha Mililita 4 (Nne) za damu zitachukuliwa kwa kutumia sindano na utasikia maumivu kiasi. Kuna uwezekano wa haya/adha wakati wa mahojiano na aina ya maswali yatakayoulizwa. Utakuwa na ruhusa ya kutokujibu maswali ambayo yatakutatiza kiakili.

Kushiriki kwako katika utafiti huu ni wa hiari na unaruhusiwa kujiondoa kwenye mjadala /mahojiano wakati wowote wa utafiti huu.

SIRI

Habari zozote wakati wa mahojiano zitahifadhiwa vyema na kwa siri. Namba zitatumika badala ya Majina kwenye dodoso utakalopewa. Mtafiti hatakuwa na ruhusa ya kumuelezea mtu yeyote yale utakayoulizwa wakati wa mahojiano.

Pia tunakuhakikishia kuwa yale utakayosema pamoja na taarifa zako zote za uchunguzi vitahifadhiwa kwa siri. Jina lako halitatokea katika ripoti yeyote itakayo andaliwa baada ya utafiti isipokua namba ya utambulisho wa mshiriki katika utafiti huu. Kumbukumbu zote zitahifadhiwa katika sehemu maalum. Mtafiti pekee ndiye atakaye kuwa na kibali cha kuzipata.

GHARAMA

Hautahitajika kulipa chochote cha ziada ili kushiriki katika utafiti huu isipokua wakati wako.

Mimi _____ Nimekubali kuhusika kwenye utafiti wa ugonjwa wa Kaswende. Nimefahamu ya kwamba kujihusisha ni kwa hiyari.Nina uwezo wakujitoa katika utafiti huu wakati wowote bila kushurutishwa. Kuhusika ni bure. Pia ninakubali kuchukuliwa kipimo cha damu kwa ajili ya uchunguzi wa ugonjwa wa Kaswende.

Nimehakikishiwa kwamba mchango wangu utahifadhiwa na kutumiwa kwa utafiti kwa manufaa ya jamiii.

SAHIHI _____

Mimi_____ ninathibitisha ya kwamba nimemueleza kwa uwazi na umakini Dk, Bibi/Bi _____ kuhusiana na utafiti wa ugonjwa wa Kaswende.

SAHIHI _____

Kwa maswala yeyote kuhusiana na utafiti unaweza kuwasiliana na
Dr.Ashery Arnold Biyoboke Kutumia nambari +255 784 593 880, na +254 719 109 300

Unaweza pia kuwasiliana na Kenyatta Hospital Ethical and Research Commitee kuhusiana na Haki zako za kuhusika na utafiti huu kutumia anwani ifuatayo.

KNH/ UON-ERC
Sanduku la Posta19676 Nairobi (00202) Number ya simu (254-020)2726300 Ex