THE PREVALENCE OF URINARY TRACT INFECTIONS AMONG

MOTHERS ATTENDING ANTENATAL CLINIC AT KIU-TH

BY:MABRUK NURU ANTHAR

REG NO:BMS/0095/91/DF

A RESEACH REPORT SUBMITTED TO THE FACULTY OF CLINICAL

MEDICINE AND DENTISTRY IN PARTIAL FULFILMENT OF THE

REQUIREMENT OF THE AWARD OF BACHELOR OF MEDICINE AND

SURGERY OF KAMPALA INTERNATIONAL UNIVERSITY

SUPERVISOR:Dr. SAIMA HUSNAIN.

SEPTEMBER 2014

DECLARATIONS

I   MABRUK NURU ANTHAR, hereby declare that this research report is my original work and has not been submitted to any university or institution of higher for any academic award.

MABRUK NURU ANTHAR

BMS/0095 /91/DF

Sign ……………………… Date…………………………………

APPROVAL

This is to certify that this research report has been prepared under my supervision and has never been presented anywhere for other purpose and is now ready for submission to the faculty of Clinical Medicine and Dentistry of Kampala International University.

Sign...   Date …………………………………………

Dr. Saima Husnain

MbchB, MMED (Obstetrics and Gynecology)

LIST OF ABBREVIATIONS

ANC   Antenatal Care

GYN   Gynecology

KIU   Kampala International University

KIUTH   Kampala International University Teaching Hospital

Ml: Milliliters

OBS   Obstetrics

SPSS   Statistical Product for Social Scientist

UTI: Urinary Tract Infections

WBCs   White Blood Cells

Acknowledgement

I would love to acknowledge the contributions of the following persons whose efforts have made this research report come to be; these persons are my mother, Jamila, for her dedicated financial support towards   my studies,   and close friends for the constant moral and psychological supports that were rendered to me in the course of this training.

TABLE OF CONTENTS

Definition of Operational Terms

Prevalence or prevalence proportion is the proportion of a population found to have a condition (typically a disease or a risk factor such as smoking). It is arrived at by comparing the number of people found to have the condition with the total number of people studied, and is usually expressed as a fraction, as a percentage or as the number of cases per 10,000 or 100,000 people (Rotham, 2012)

Pregnancy is the development of one or more offspring, known as an embryo or fetus, in a woman's uterus. It is the common name for gestation in humans. A multiple pregnancy involves more than one embryo or fetus in a single (MedicineNet, 27 April 2011)

UTI is defined as the presence of at least 100,000 organisms per milliliter of urine in an asymptomatic patient, or as more than 100 organisms/mL of urine with accompanying pyuria (> 7 white blood cells [WBCs]/mL) in a symptomatic patient (Johnson, 2014)

Abstract

The frequency of urinary tract infection (UTI) in pregnant women (0.3-1.3%) is similar to that in nonpregnant women Changes, Overall, UTIs are 14 times more frequent in women than in men. This difference is attributed to the various factors.

A retrospective study was conducted at Ishaka Adventist Hospital to determine the prevalence of UTI among mothers attending ANC at Ishaka Adventist Hospital.

The study found that 26(30.23%) of the respondents were positive for UTI while 69.77% (60) mothers tested negative for UTI, most of the mothers which had UTI were within the parity of 0-1 16(16.6%), most of the mothers who had UTI were within the age groups of 15-24 years old 21(21.4%), and further showed that most of the mothers who had UTI were within the third trimesters 15(15.4%), E.coli, 11(47.2%) and Enterococcus 5(22.7%).

This study concluded that the physiological changes of pregnancy predispose women to UTI so does other factors such as age, parity and gestational age. All pregnant women should be screened for UTI with a urine culture, the goal of early diagnosis and treatment of UTI during pregnancy is to prevent complications with all the added benefits to the mother and the Fetus.

This Study recommended that; The hospital should adapt the culture and sensitivity techniques in determining the presence and prevalence of UTI in pregnancy, the hospital should encourage education of mothers attending to the ANC on personal hygiene and infections prevention and that the hospital should screen all mothers attending to the ANC for possible asymptomatic UTI since the current system only deal with symptomatic infections of UTI.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

In this chapter, the researcher has presented the background information related to the observed prevalence of urinary tract infections in pregnancy, the problem statement, study objectives and questions and the justifications of the study.

1.1 Background

UTI is defined as the presence of at least 100,000 organisms per milliliter of urine in an asymptomatic patient, or as more than 100 organisms/mL of urine with accompanying pyuria (> 7 white blood cells [WBCs]/mL) in a symptomatic patient. A diagnosis of UTI should be supported by a positive culture for a uropathogen, particularly in patients with vague symptoms.

UTI is defined either as a lower tract (acute cystitis) or upper tract (acute pyelonephritis) infection and asymptomatic bacteriuria in pregnant women (Thomas M Hooton, 2011)

The frequency of urinary tract infection (UTI) in pregnant women (0.3-1.3%) is similar to that in non pregnant women Changes

Overall, UTIs are 14 times more frequent in women than in men. This difference is attributed to the following factors:the urethra is shorter in women ,in women, the lower third of the urethra is continually contaminated with pathogens from the vagina and the rectum, Women tend not to empty their bladders as completely as men do and the female urogenital system is exposed to bacteria during intercourse too.

Maternal UTI has few direct fetal sequelae because fetal bloodstream infection is rare; however, uterine hypoperfusion due to maternal dehydration, maternal anemia, and direct bacterial endotoxin damage to the placental vasculature may cause fetal cerebral hypoperfusion.

UTIs are associated with risks to both the fetus and the mother, including pyelonephritis, preterm birth, low birth weight, and increased perinatal mortality (Johnson, 2014)

Urinary tract infections are the most common bacterial infections during pregnancy. Pregnancy hormones cause changes in the urinary tract which make infections more likely. In addition, as the uterus grows it presses on the bladder and can prevent complete emptying of urine. This stagnant urine is a likely source of infection. Untreated, these infections may lead to kidney infections and premature labour (Hicks, 2014)

In most cases of asymptomatic bacteriuria and urinary tract infection (UTI) in pregnancy, the prognosis is excellent. The majority of long-term sequelae are due to complications associated with septic shock, respiratory failure, and hypotensive hypoxia (ie, extremity gangrene).

1.2 Problem of the statement

Urinary tract infections are the most common bacterial infections during pregnancy accounting for approximately 10% of hospital visits by women (Millar, 2009) These infections can be asymptomatic or symptomatic bacteriuria occurring in 5–10% and 1–3% among pregnant women, respectively (Gilstrap, 2001). In a study in Hanang in northern Tanzania a prevalence of UTI of 16.4 % among pregnant women has been reported by (Olsen, 2000), studies in Uganda about the prevalence and characterization of Urinary Tract Infections are limited. Community-acquired urinary tract infections (occurring in people not admitted to hospital prior to development of the symptoms of the infection) occur mostly in women and are most commonly caused by *Escherichia Coli (E.coli)*.

Mwaka et al in Mulago showed that, the prevalence of asymptomatic bacteriuria among HIV/AIDS (20.6%) in Uganda was higher than the Uganda national rates (6.9%).Very few studies have so far been done in Uganda to assess the prevalence and the etiologies of UTI among pregnant mothers attending Antenatal care in Uganda.
It is on this background that this study is being designed to determine the prevalence of UTI in Kampala International University Teaching Hospital.

1.3 Study Justification

Results from the study will provide additional resources and reference for future researchers in the same areas of interest, and finally, the study results will be subjected to further evaluations to improve understandings of the prevalence and the microbiological profile of the organisms that are responsible for the infections resulting into Urinary tract infections at Antenatal care in Kampala International University Teaching Hospital.

1.4 Study Objectives

1.4.1 Broad Objectives

To determine the prevalence of urinary tract infections among mothers attending antenatal care at Kampala International University teaching Hospital

1.4.2 Specific Objectives

1. To determine the parity and gestational age of mothers most diagnosed with urinary tract infections at KIUTH Hospital between October 2013 and September 2014.
2. To determine the number of mothers who tested positive on laboratory investigations within October 2013 to September 2014
3. To determine the microbiological profile of the urinary tract infections among mothers attending antenatal care at Kampala International University Teaching Hospital between October 2013 and September 2014.

1.5 Research Questions

1. What is the number of mothers from Antenatal Clinic who have tested positive for urinary tract infections at KIUTH
2. What parity and age groups among mothers attending Antenatal Care at KIUTH are mostly suffering from KIUTH
3. Which microorganism are responsible for most of the urinary tract infections among mothers attending Antenatal carte at KIUTH

1.6 Scope of the study

The study was conducted within Ishaka Adventist Hospital, Ishaka town, Bushenyi district, western Uganda. The study was done at the Antenatal care Clinic of the hospital and the outpatient laboratory.The study was conducted from october 2013 to November 2014. The data that shall be included in the study shall be those that were recorded between October 2013 and September 2014.

The study determined prevalence, the age and parity most affected and the microorganisms that are most isolated from the urine cultures and microbiological investigations at KIUTH.

CHAPTER TWO

LITERATURE REVIEW

Bacteriuria occurs in 2 to 7 percent of pregnancies, particularly in multiparous women, a similar prevalence as seen in nonpregnant women. The organisms are also similar in species and virulence factors in pregnant and nonpregnant women. Thus the basic mechanism of entry of bacteria into the urinary tract is likely to be the same for both groups (Stengvist K, 1987)

Bacteriuria has been associated with an increased risk of preterm birth, low birth weight, and perinatal mortality (Kass, 1960; Naeye, 1979; Delzell ZE jr, 2000).

As an example, a review of over 50,000 pregnancies between 1959 and 1966 showed that women with bacteriuria and/or pyuria (no comment on the presence or absence of symptoms) in the last two weeks of pregnancy had a higher rate of perinatal mortality from a variety of causes than noninfected women (Naeye, 1979) .

Studies have also shown that treatment of bacteriuria during pregnancy reduces the incidence of these complications (Kass, 1960) and lowers the long-term risk of sequelae following asymptomatic bacteriuria (Zinner SH, 1971)

Versi et al described a higher prevalence of bacteriuria in pregnant white women (6.3%) than in pregnant Bangladeshi women (2%). Pregnancies that resulted in preterm deliveries were strongly associated with bacteriuria in white women; this association was not observed in Bangladeshi women. The authors hypothesized that the difference could be due to variation in hygiene practices and clothing (Versi E, 1997)

A large population-based study of nearly 200,000 pregnant Israeli women demonstrated a 2.5% rate of asymptomatic bacteriuria (Mazor Dray E, Feb 2009) and a 2.3% rate of symptomatic UTI (Sheiner E, 2009) In this population, asymptomatic bacteriuria was found to have an association with multiple pregnancy complications, including hypertension, diabetes, intrauterine growth retardation, prolonged hospitalization, and preterm labor.

The authors suggested that these findings may be a marker for intensity of prenatal care rather than a specific causal effect of the urinary infection (Mazor Dray E, Feb 2009) Additionally, their follow-up study examining women with symptomatic UTI showed a clear association between UTI and low birth weight and preterm delivery, a finding consistent with those of multiple previous investigations (Sheiner E, 2009)

The prevalence of UTI during pregnancy increases with maternal age. A retrospective analysis of 24,000 births found the prevalence of UTI during pregnancy to be 28.7% in whites and Asians, 30.1% in blacks, and 41.1% in Hispanics. When socioeconomic status is controlled for, no significant interracial differences seem to exist. A survey-based analysis of self-reported UTI found similar trends. This study also considered Native American women and found the highest prevalence of UTI in this population (24.2%) as compared with Asian (10.3%), white (16.6%), Hispanic (18.3%), and black (20.3%) women (Whitehead NS, 2009)

UTI is associated with preterm delivery in persons of all races. The adjusted odds ratio in infants with very low birth weight is 2.8 in blacks and 5.6 in whites, adjusted for parity, body mass index, maternal age, marital status, cigarette smoking, education, and prenatal care. The overall relative risk of bacteriuria in blacks or whites is estimated at 1.5-5, and the relative risk of preterm birth in women with bacteriuria is 1.8-2.3 (Whitehead NS, 2009)

Untreated upper UTIs are associated with low birth weight, prematurity, premature labor, hypertension, preeclampsia, maternal anemia, and amnionitis (Hill JB, 2005) A retrospective population-based study by Mazor-Dray et al showed that UTI during pregnancy is independently associated with intrauterine growth restriction, preeclampsia, preterm delivery, and cesarean delivery (Mazor Dray E, Feb 2009)A prospective cohort study of pregnant patients also suggested an association between maternal UTI and childhood asthma (Collier CH, 2013)

Several patient-level factors are associated with an increased frequency of bacteriuria during pregnancy. Compared with nonindigent patients, indigent patients have a 5-fold increased incidence of bacteriuria. The risk is doubled in women with sickle cell trait. Other risk factors for bacteriuria include diabetes mellitus (Alvarez JR, 2010) neurogenic bladder retention, history of

vesicoureteral reflux (treated or untreated) (JG, 2009) previous renal transplantation (Ghafari A, 2008) and a history of previous UTIs.

CHAPTER THREE

STUDY METHODOLOGY

3.0   Introduction

In this Chapter presents the researcher has presented detailed descriptions of the methods that will be employed to collect, analyze and present data. It also entails research design, population and sampling techniques, target population, sample size, data collection methods, research instruments and procedures, data and assumptions.

3.1 Study Design

This was a cross sectional study, exploratory and descriptive in nature, and employed quantitative methods. The quantitative methods is chosen since it enabled the researcher collect a large number of data within a short time and since there is flexibility of numbers under this design without affecting the validity and reliability of the information collected.

3.2 Study Site

The study was conducted in Kampala International University Teaching Hospital, located at Ishaka Bushenyi in western Uganda. Kampala International University Teaching Hospital is along Mbarara Kasese highway, only approximately 5km from Bushenyi district headquarters. It consists of the following departments, pediatrics, antenatal clinic, postnatal clinic family planning, young child clinic, Obstetrics and Gynecology (OBS & GYN) and labour ward among others. It has 30 specialists, 20 doctors (MO), intern doctors and nurses equaling to 80 KIU-TH has 500 beds with a population of 200 patients per day. Antenatal Care Clinic evaluates about 20 mothers on each working day (Monday- Friday).

3.3 Study Population

The study population included pregnant mothers attending to Ishaka Adventist Hospital within the Month of October 2013 to September 2014. Approximately 12000 mothers assess ANC services at Ishaka Adventist Hospital per year with different and varying complications. The study only considered mothers who had signs of UTI and their urine samples were taken into the laboratory for urinalysis.

3.4 Inclusion and Exclusion Criteria

3.4.1 Inclusion Criteria

All the records of mothers who were enrolled in the laboratory registers between October 2013 and September 2014 were included in the study

3.4.2 Exclusion Criteria

All the records of mothers who were done before the month of October 2013 and after the month of September 2014.

3.5 Sampling Procedure

All the records of urine examination from the laboratory were evaluated and all the positive samples counted; the sampling involved a purposeful selection of records from the maternity to evaluate for the number of positive

3.5.2 Sample Size Determination

Sample size was determined by use of Sloven Formula given by

$$n = \frac{N}{1 + N(e)^2}$$

Where N is the number of mothers who were screened for UTI in pregnancy, e is the sampling error which is 10%

So when substituted in the above equation;

$$n = \frac{2678}{1 + 2678(0.1)^2}$$

$$n = \frac{2678}{1 + 26.78}$$

$$n = 96$$

1.6 Data Collection Methods

3.8.1 Data Collection tool

Simple data collection toll was developed with the structured sets of variables which included during the data collection. The data collection tool captured data regarding demographics (sex and age), the parity and the microbial profile of the urinalysis results.

3.8.1 Study Procedure

The head of department laboratory was informed of the date and time of data collection. This gave time for the researcher to collect the record from 10:00am in the morning and 2:00pm in the afternoon every day for five days. The collection of the data began after forty eight hours to after informing the laboratory in charge to allow the laboratory personnel have enough time to get all the records in one place.

1.9 Ethical Consideration

Approval was obtained from the faculty of clinical medicine and dentistry of Kampala International University (KIU) western campus. Subsequently:

▪ Privacy and confidentiality for records provided was assured. The hospital was assured that information provided will be used strictly for the purpose it was collected. The data collected will be assigned specific numbers and letters to avoid disclosing a respondent's identity.

▪ Participant's safety were assured, and disclosure of respondents' identity were avoided to minimize the risk of hurting the individuals whose records are being reviewed for the study. All the data collected from the different respondents were kept in a safe private place until when data entry is complete. Immediately thereafter, all the questionnaires were kept under key and locked.

3.10 Data Analysis

Statistical analysis was done in SPSS. The raw data was entered and stored for analysis using the SPSS data analysis tool kit.

Prevalence was determined by calculating the number of respondents reporting whose urinalysis reports are positive divided by the number of mothers who attended ANC services at Ishaka Adventist Hospital multiplied by 100.

Prevalence of UTI $= \frac{Number\ of\ Urine\ test\ (positive)}{Mothers\ attending\ ANC} \times 100,$

3.11 Study Limitation

One potential limitation was that the study focuses on determining prevalence based on laboratory records rather than clinical investigations to determine and categories UTI. Laboratory records alone is a weak measure to determine the prevalence of UTI given the fact that some mothers may not be investigated or may not complain about the UTI during ANC visit. Further research need to be conducted to determine the prevalence and categorization of UTI using both clinical, self-reported and laboratory criteria.

CHAPTER FOUR

STUDY FINDINGS AND RESULTS

4.0 General Introductions

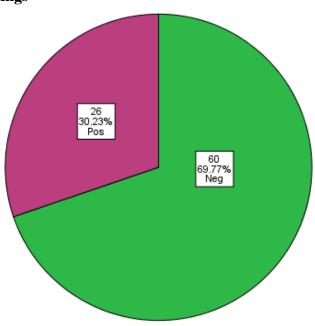## 4.1 Objective One findings

Figure 1. Proportion of Mothers with Positive Urinalysis Test:

Figure 1 shows that 26(30.23%) of the respondents were positive for UTI while 69.77% (60) mothers tested negative for UTI as shown by the figure above.

Table 1: Parity of Mothers with UTI

Variable	N=96	UTI		
Parity		Yes	No	Percentage of UTI
0-1		16	19	16.6%
2-3		15	34	15.6%
4 and above		8	4	8.6%

Table 1 above shows that most of the mothers which had UTI were within the parity of 0-1 16(16.6%), followed by the 2-3 parity group who were 15(15.6%) and the least was mother with parity of 4 and above 8(8.6%)

Variable N=96	UTI		
Age	Yes	No	Percentage of UTI
15-24	21	30	21.4%
25-34	10	17	10.1%
35-44	4	8	4.3%
45 and above	1	5	1%

Table 2: Age groups of Mothers

Table 2 above showed that most of the mothers who had UTI were within the age groups of 15-24 years old 21(21.4%), followed by the age groups of 25-34 who were 10(10.1%) and the least was mother with age groups of 45 and above 1(1.%)

Variable N=96	UTI		
Gestational Age	Yes	No	Percentage of UTI
1st trimester	11		12.4%
2nd Trimester	10		10.3%
3rd Trimester	15		15.4 %

Table 3: Gestational Age of Mothers

Table 3 above showed that most of the mothers who had UTI were within the third trimesters 15(15.4%), followed by the those in the 1st trimester 15(15.4%) and the least was mother within the second trimester 15(15.4%)

Variable	N=24	UTI	
Microrganisa		Yes	Percentage of UTI
E.coli		11	47.2%
Enterococcus		5	22.7%
K. pneumoniae		2	10.3%
Others		6	19.8%

Table 4: Distribution of Organisms Isolated

Table 4 showed that the most isolated organisms in this study were E.coli, 11(47.2%) and Enterococuc 5(22.7%) and K.pneumoniae 2(10.3%) of the 24 mothers whose culture and sensitivey reulsts were retrived. Others were 19.8(6) mothers.

CHAPTER FIVE

DISCUSSION

5.1 Discussions

The overall prevalence of bacteriuria among pregnant women in this study was 26(30.23%). This is higher than the prevalence of UTI (16.4%) among pregnant women in northern Tanzania according to Olsen *et al,* 2010. The prevalence of symptomatic and asymptomatic bacteriuria was observed to be 17.9% and 13%, respectively.

A study in Enugu, Nigeria reported similar findings (Ezeome *e., a*l2006). However, the prevalence of asymptomatic bacteriuria observed in this study is significantly high compared to those reported in developed countries and this is likely to be attributed to low socio-economic status (Gilstrap *et al.,* 2011, Santos *et al.,* 2012; Sheikh *et al.,* 2010).

Another factor for the high prevalence of UTI could also be due to the method of sampling used in the study as well as the methods of analysis. In the above studies, urine culture was the main method of investigation, whereas in this study all the samples were first screened using a screening test by use of urinary strips.

Different factors have been documented to contribute to UTI among pregnant women. These include age, parity, gestation age, level of education (Gilstrap et al., 2011; Smaill et al., 2007; Santos et al., 2002; Dimetry et al., 2011).

Other factors like low socio-economic status, not washing genitals before and after coitus, not voiding urine postcoitus and washing genitals from back to front have observed as risk factors for UTI during pregnancy 29,30. Prevalence of bacteriuria in well status women is found to be 25% in a study by Dimetry 2007 and Amirir 2009 in their study.

This study showed that most of the mothers who had UTI were within the age groups of 15-24 years old 21(21.4%), followed by the age groups of 25-34 who were 10(10.1%) and the least was mother with age groups of 45 and above 1(1.%)

This study showed that there is an increasing prevalence of UTI among mothers with increasing age groups. One study by Masinde, 2011 showed that the prevalence of infection in relation to age are were such that, individuals of the age group 21-25 years had the highest incidence of infection (44.61 %). Followed by age group 26-30 years (27.69 %), 31-35 years (16.92%) and 16 -20 years (6.15%). While the age group 36- 40 years had the lowest incidence of infection (4.61%).

In this study, the frequency of urinary tract infection was higher in the third trimester compared to the first and second trimester. This is in agreement with Leigh,2012 who reported an increased frequency of urinary tract infection in the third trimester compared to the first and second trimester of pregnancy. However, this report does not agree with Onuh et al, 2010 who reported a higher prevalence of urinary tract infection in the second trimester compared to the third trimester. This difference may be as a result of either change in urinary stasis and vesicoureteral reflux or decrease in urinary progesterone and estrogens in the various trimester of pregnancy.

This study showed that most of the mothers who had UTI were within the third trimesters 15(15.4%), followed by the those in the 1st trimester 15(15.4%) and the least was mother within the second trimester 15(15.4%)

In one study by Gumodoka the prevalence of symptomatic and asymptomatic bacteriuria was 17.9% and 13%, respectively. High rate of bacteriuria was observed in the third trimester with 85.8% and 90.9% of symptomatic and asymptomatic bacteriuria, respectively. As to date, what cause the high rate of UTI in third trimester is not clearly known, most scholars believe this could be due to the stasis of urine with the increasing weight of the baby and obstruction of the urethra.

This study showed that most isolated organisms in this study were E.coli, 11(47.2%) and Enterococuc 5(22.7%) and K.pneumoniae 2(10.3%) similar to the findings of Ouhlo et al who showed that in pregnancy, E.coli constitute the majority of the bacterial UTIs, this could be that

the physiologiocal changes in pregnancy affect the immune defense of the mothers and thus reduces their defence from simple bacterial infections since the bacteria which are shown to b causisng infections in these mothers were mainly normal bacterial groups. Another reason could be that this is due to the fact that most of the women do not clean themselves or practices good hygineen ; like cleaning from front to back, washing hands after using the toilets

5.2 Conclusion

The physiological changes of pregnancy predispose women to UTI so does other factors such as age, parity and gestational age. All pregnant women should be screened for UTI with a urine culture, the goal of early diagnosis and treatment of UTI during pregnancy is to prevent complications with all the added benefits to the mother and the Fetus.

5.3 Recommendations

This Study recommended that

1. The hospital should adapt the culture and sensitivity techniques in determining the presence and prevalence of UTI in pregnancy

2. The hospital should encourage education of mothers attending to the ANC on personal hygiene and infections prevention

3. The hospital should screen all mothers attending to the ANC for possible asymptomatic UTI since the current system only deal with symptomatic infections of UTI

REFERENCE

Alvarez JR, F. A. (2010). Asymptomaticbacteriiruia in pregestational diabetic pregnancies and the role of group B Streptococus. *American Journal of perinatal* , 231-4.

American Academy of Peadiatric and American College of Obstetric and Gynaecology. (2007). *guidlines for perinatal care.* New York: American Academy of peadiatrics.

Collier CH, R. K. (2013). Maternal Infecions in pregnancy and risk of asthma in offsrping. *Maternal child health*, 1940-50.

Delzell ZE jr, L. M. (2000). Urinary tract infections during pregnancy . *American familly physicians* , 61-713.

Ghafari A, S. H. (2008, Jan-feb). Pregnancy after renal transplanatation: ten year single center experience . *transplant proc*, pp. 251-2.

Gilstrap, L. &. (2001). Urinary tract infections during pregnancy. *obstretric and gynaecology*, 581-91.

Hicks, R. (2014, March 31). *Pregnancy guide*. Retrieved September 7, 2014, from WebMD: www.webmd.com

Hill JB, S. N. (2005). Acute pyelonephritis in pregnancy. *Journal of obstetrics and gyanaecology*, 18-23.

JG, H. (2009, september 4). Outcome of pregnancy in women with a history of vesico-uretric reflux. *BJU International* , pp. 780-4.

Johnson, E. K. (2014, Febuary 5). *Urinary Tract Infections*. Retrieved September 8, 2014, from Medscape: www.medscape.com

Kass, E. (1960). Bacteriuria and pyelonephritis of pregnancy. *Arch Internal Med*, 105-194.

Mazor Dray E, L. A. (Feb 2009). Urinary tract infections: is it independently associated with adverse pregnancy outcomes? *Journal of Maternal Fetal Neonatal Medecine* , 124-8.

MedecineNet. (27 April 2011). *Embryo defination.*

Millar, S. (1009). Urinary tract infections complicating pregnnacy. *Infectious disease clinic of North America*, 13-26.

Naeye, R. L. (1979). Causes of excessive rates of perinatal mortality and prematurity in pregnancies complicated by maternal urinary tract infections. *New England Journal of Medecine*, 300-819.

Olsen, B. H. (2000). the diagnosis of Urinary tract infections amon pregnant women in rural tanzania: prevalances and correspondence between different diagnostic methods. *Acta Obstetrics gynaecology scandinavia*, 729-736.

Rotham, K. J. (2012). *Epidemiology: An Introduction.* New York: Oxford University Press.

Sheiner E, M. D. (2009). Asymptomatic bacterium during pregnancy . *Journal of Maternal Fetal and Neonatal Medecine* , 423-7.

Stengvist K, S. T. (1987). Virulance factors for Escherichia Coli in Urinary Isolates from Pregnant women. *Infectious Disease*, 870.

Thomas M Hooton, S. B. (2011, April 27). *Urinary tract infections and asymptomatic bacteriuria in pregnancy*. Retrieved September 4, 2014, from up to date: www.uptodate.com

Versi E, C. P. (1997). Bacteriuria in pregnancy: a comparisio of Banglasdeshi and Caucasian women. *Internationla Journal of Pelvic Floor Dysfunction*, 8-12.

Whitehead NS, C. W. (2009). Racial,ethnic and economic disparitites in the prevalance of pregnancy complications . *Maternal Child Health Journal* , 198-205.

Zinner SH, K. E. (1971). Long term(10 to 14 years) follow up of bacteriuria of pregnancy. *New England Journal of Medecine*, 285.

Appendix I: Data Collection Tools

Date of Lab request:…………………………………..

Mothers Age:…………………………………………..

Education Level:

1. None
2. Primary
3. Secondary
4. Tertiary/University

Occupation

1. Employed
2. Unemployed
3. Student
4. Business

Mothers Parity:………………………………..………

Gestational Age:

1. 1st Trimester
2. 2nd Trimester
3. 3rd Trimester

Type of Investigations

1. Urine Culture
2. Lab Microscopy
3. Urine Strip Test
4. Others (specify)………………………………………………..

Lab Resulst:

1. Negative
2. Positive
3. Missing Results

Lab Results; if positive

1. E.Coli ⬜
2. Proteus ⬜
3. Klebsiella ⬜
4. Strep efficalis ⬜
5. Staph aureus ⬜
6. Others……………………………………………………….

S/NO.	ACTIVITIES	J	A w1	W2	w3	S w1	w2	O	N	D w1	w2	w3	Responsible Person.
1	Topic formulation	■											Student/Nuru
2	Draft proposal writing		■	■	■	■							Student/Nuru
3	Approval of proposal						■	■					Supervisor/
4	Data collection							■	■				Student/Nuru
5	Data analysis and limitation.								■	■			Student/Nuru
6	1st draft report									■	■		Student/Nuru
7	Correction of 1st draft										■		Student/sup.
8	Pdn. of final report.										■		Student/Nuru
9	Approval of report											■	Supervisor/
10	subn. of final report											■	Student/Nuru

Appendix III: Letter of Introduction

KAMPALA INTERNATIONAL UNIVERSITY

EXPLORING THE HEIGHTS

Ishaka Bushenyi * PO BOX 71 Ishaka, Uganda
Tel: +256 (0)771696711/0703817216 Fax: +256 (0) 41 - 501 974
E-mail: admin@kiu.ac.ug * Website: http://www.kiu.ac.ug

OFFICE OF THE DEAN,
FACULTY OF CLINICAL MEDICINE & DENTISTRY

7/11/2014

TO WHOM IT MAY CONCERN

RE: MABRUK NURU ANTHAR   (BMS/0095/91/DF)

The above named is a student of fifth year at Kampala International University pursuing a Bachelor of Medicine, Bachelor of Surgery (MBChB) programme.

She wishes to conduct her research project in your Hospital.

Topic: The prevalence of urinary tract infections among mothers attending antenatal clinic at Kampala International University - Teaching Hospital.

Any assistance given will be appreciated.

Dr. Akib Surat
Asso. Dean, FCM &D

05 NOV 2014
FACULTY OF CLINICAL MEDICINE & DENTISTRY

"Exploring the Heights"

23