WOLKITE UNIVERSITY

COLLEGE OF HEALTH SCIENCE

DEPARTMENT OF MEDICAL LABORATORY SCIENCE

PREVALENCE OF URINARY TRACT INFECTIONS AND ITS ASSOCIATED FACTORS AMONG PREGNANT WOMEN ATTENDING ANTENATAL CARE AT WOLKITE UNIVERSITY SPECIALIZED HOSPITAL, SOUTH WEST ETHIOPIA

BY:

TSION FIKRE

MITIKU GEBRE

EDELU TERE

MUBARIK FARIS

A RESEARCH PAPER SUBMITTED TO WOLKITE UNIVERSITY, COLLEGE OF MEDICINE AND HEALTH SCIENCE, DEPARTMENT OF MEDICAL LABORATORY SCIENCE FOR PARTIAL FULFILMENT OF THE REQUIREMENT FOR BACHELOR SCIENCE OF DEGREE IN MEDICAL LABORATORY SCIENCES

JANUARY,2022

WOLKITE ETHIOPA

PREVALENCE OF URINARY TRACT INFECTIONS AND ITS ASSOCIATED FACTORS AMONG PREGNANT WOMEN ATTENDING ANTENATAL CARE AT WOLKITE UNIVERSITY SPECIALIZED HOSPITAL, SOUTH WEST ETHIOPIA

BY:

TSION FIKRE

MITIKU GEBRE

EDELU TERE

MUBARIK FARIS

A RESEARCH PAPER SUBMITTED TO THE DEPARTMENT OF MEDICAL LABORATORY SCIENCE, WOLKITE UNIVERSITY IN PARTIAL FULFILLMENT OF REQUIREMENT FOR BACHELOR OF SCIENCE IN MEDICAL LABORATORY SCIENCE

ADVISOR: MIHIRET ALEMAYEHU (ASS. PROFESSOR)

BISRAT FIKADU (MSc BSc)

SEID ABRAR (MSc, BSc)

Contents

ACKNOWLEDGEMENT

We would like to thank, Wolkite University department of Medical Laboratory Science for offering us this opportunity and our appreciation also goes to Bisrat Fikadu (MSc, BSc), Mihret Alemayehu (Assistant Professor) and to Seid Abrar (MSc, BSc) for their magnificent support and fruitful advises while developing this research paper.

ABSTRACT

Background: Urinary tract infection is global health problem that has an impact in both developing and developed countries, being one of conventional challenges responsible for maternal and perinatal morbidity.

Objective: To determine Prevalence of urinary tract infection and its associated factors among pregnant women attending antenatal care at Wolkite University specialized hospital from March 22 to April 22, 2014 E.C.

Methods: A Hospital-based cross-sectional study was conducted among 268 pregnant women from March 22-April 22 to determine prevalence and risk factors of UTI among pregnant women. Convenience sampling technique was employed to select study subjects. Data were collected using structured questionnaire. Then the data was entered and analyzed using SPSS version 22 Binary logistic regression models were situated to identify associated factors. All variables with probability value of ≤ 0.25 at bivariate logistic regression analysis were entered in to the multivariate logistic regression model to control the possible effect of cofounders.

a probability value of less than 0.05 was considered statically significant. Adjusted odds ratio with its 95% confidence interval was used to declare the statistical significance between UTI and associated factors.

Result: The overall prevalence of UTI among pregnant women in our study was 22.4%. The study revealed that lack of education, multiparty and low socio-economic status had been significantly associated with developing the UTI. More than half of pregnant women were multiparous and illiterate.

Conclusion: Based on the findings of this study UTI remain a conventional problem during pregnancy. As the physiological changes of pregnancy predispose women to UTI so does other factors suggested by our study such as lack of education, multiparty and low socio-economic conditions.

Keyword: prevalence, urinary tract infection, pregnant women

LIST OF TABLES

LIST OF ABBREVIATION AND ACRONYMS

UTI-urinary tract infection

WKUSH-Wolkite University Specialized Hospital

ANC-antenatal care

SOP- standard operating procedure

WKUCMHS-Wolkite University College of medicine and health science

SNNPR-South Nation, Nationalities and Peoples' Region.

TERMINOLOGIES

UTI is an infection in any part of the urinary system: the kidney, the ureter, bladder and, urethra.

CYSTITIS is a urinary tract infection that affect bladder.

PYELONEPHRITIS is urinary tract infections that affect urethra

PREVALENCE is the proportion of a population with a disease or a particular condition at a specific point in time or over a specified period of time**.**

PYURIA is defined as presence of more than 5 white cells per high power field or a urinary dipstick test that is positive for leukocyte esterase.

BACTERIURIA is presence of bacteria in urine.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Urinary tract infection (UTI) is the infection of any part of the urinary tract. The urinary tract consists of the kidneys, ureter s, bladder and urethra. Any part of these structures can become infected but bladder and urethra infections are the most common. The bladder infection is known as cystitis while that of the urethra is known as pyelonephritis (1).

Anatomically UTI can be classified into_lower urinary tract infection involving the bladder and urethra and upper urinary tract infection involving the kidney, pelvis, and ureter. The upper UTI is potentially more serious than the lower one because there is a possibility of kidney damage. It can also be classified as asymptomatic (involve lower urinary tract) and symptomatic (involve upper urinary tract) based on site of infection and bacterial load (2, 3).

Pregnancy in women can predispose one to urinary tract infection**,** at around 6th week of pregnancy due to the physiological changes of pregnancy the ureters begin to dilate. This is also known as "hydronephrosis of pregnancy", which peaks at 22-26 weeks and continues to persist until delivery. Both progesterone and estrogens levels increase during pregnancy and these will lead to decreased ureteral and bladder tone. Increased plasma volume during pregnancy leads to decrease urine concentration and increased bladder volume. The combination of all these factors leads to urinary stasis and uretero-viseral. The decreased urine concentration can also result in glucosuria and reduction in immunity of pregnant women appears to encourage bacterial growth (2,3).

Most UTIs are caused by bacteria that can live in the digestive tract, the vagina or around the urethra. Infection occurs when bacteria enter the normally sterile urinary system and multiply there. They produce enzymes which help them feed on tissues of the host and thus damage them. They can enter the urinary system through the urethra or more rarely through the blood stream (4).

Women are more prone to UTI than males because their urethra is much shorter and closer to the anus than in males. Hence bacteria from the anus can pass easily into the urinary tract. Females also have three openings in a very small area (the rectum, the vagina and the meatus of the

urethra). Women also lack the bacteriostatic properties of prostatic secretions that are present in males (5).

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 (>5 WBCs/mL) in a symptomatic patient. Particularly in asymptomatic patients, a diagnosis of UTI should be supported by a positive culture (6).

Some common symptoms of UTI are frequent urinations, frequent urge to urinate, pain/burning sensation in urethra when urinating, discomfort at lower abdomen, soreness in the lower abdomen and back. When the infection is well developed and had spread up to the kidney and uterus, back pains, chills, fever, nausea and vomiting may be experienced. Three common clinical manifestations of UTIs in pregnancy are: asymptomatic bacteriuria, acute cystitis and acute pyelonephritis (7).

The infection can be diagnosed by testing clean urine sample for white blood cells and other components. Urine may also be cultured to allow the growth of any bacteria and subsequent identification (7).

1.2 STATEMENT OF THE PROBLEM

Urinary tract infection is global health problem affecting both developing and developed countries; nearly 150 million deaths per year occur worldwide because of UTI and its associated complications. It can be developed in 40%-50% of women and 5% of men. Around 20% of the pregnant women are reported to have UTI. (30) Major achievements have been made in reducing the global burden of UTI with expansion of effort to improve UTI treatment and control, but still UTI remains an important global health concern (8).

After anemia, UTIs are the second most common complication in pregnant women, which if not controlled well can adversely affect the health of infant or the pregnant mother. During pregnancy UTI contributes significantly to maternal and perinatal morbidity (9). Abortion, small birth size, maternal anemia, hypertension, preterm labour, phlebitis, thrombosis and chronic pyelonephritis are related to urinary tract infection during pregnancy (9, 10). E. coli remains the predominant organism implicated in urinary tract infection in pregnancy (10).

During pregnancy, urinary tract infection is the most common bacterial infection. In developing countries mostly, it occurs in the low socio-economic populations. A survey has been conducted in US and estimated that around 8 million cases of UTI occurs annually with huge economic implications. Valiquez et al. reported the occurrence of UTI in pregnant women to be 12-40% in developing countries. (11)

Despite the fact that it's a global health concern, evidences showed that pregnant women in developing countries have higher rate of UTI and its burden than developed nations (11). In Ethiopia the burden of UTI among pregnant women ranges from 9.8% (12) to 26.6% (13).

UTI is the most recurrent acquired infection. It is seen as a result of number of contributing factors. Increased age, number of childbirths, number of intercourses per week, diabetes, recessive sickle cell anemia, previous history of UTI, immunodeficiency and urinary tract abnormalities are some of the factors that increase risk of UTI in pregnant women (14).

1.3 SIGNIFICANE OF THE STUDY

This research was carried out in order to find out prevalence of urinary tract infections with the aim of identifying the distribution of UTI among pregnant women attending antenatal care at WKUSH and its associated factors. Since UTI in pregnant women is one of the most serious manifestations affecting both mother and the fetus, this study play a role in improving mother and child health by displaying the distribution and help to awaken professionals to take more actions for health education provision for pregnant women specifically about UTI and its symptoms in order to enable them to complain early when they feel the symptoms, which is preferable to manage, and methods to reduce its chance of occurrence.

CHAPTER TWO
2.1 LITERATURE REVIEW

According to the Study conducted at Dezful city, Iran to investigate the incidence of UTI in pregnant women and its impact on the health and growth of their infant results of the study showed that 5% of the pregnant women of the city were infected with UTIs during their pregnancy and were hospitalized due to UTI(15). The incidence of UTI in the city of Bam, Iran was 12.3% in a study done by Soleymanizadeh et al. on 1500 pregnant women (16). In another study conducted in the city of Gorgan, Iran by Mobbasheri et al. on 900 pregnant women, the incidence of UTI was 3.7% among them (17).

The study conducted in city called Nepal by Khushbu Yadav and Satyam Prakash reveals the prevalence rate of AUTI among pregnant women was 42% which is almost in accordance with a study conducted by Valentina and Srirangaraj in 2016, the prevalence of UTI in pregnant women was 45%. Yadav LK and Yadav RL in 2018 from Chitwan Medical College reported AUTI of 51.83%. The prevalence of significant asymptomatic bacteriuria called the asymptomatic UTI (AUTI) in pregnancy. (18).

The reason behind for higher prevalence of urinary tract infection could be attributed to the low-income status of the patients, anemia, sexual activity during pregnancy, lack of proper personal hygiene, environmental hygiene, population susceptibility, poor housing, ventilation, sanitation and drainage systems (19).

Based on the study conducted in brazil in 2021 to assess the prevalence of urinary tract infection in pregnant women attended by basic health unit in Jaraguá do Sul it was possible to identify that 14.63% of the pregnant women had UTI during pregnancy, the most common pathogen was Escherichia coli in 77.78& of the cases, with 12.5% having recurrence. Pregnant women in the 2nd trimester were the most affected 48.15% of the cases (20).

A cross-sectional study was carried out to determine the prevalence of UTI among symptomatic and asymptomatic pregnant women attending Bungando Medical Center (BMC) in Mwanza, Tanzania using midstream urine (MSU) culture on standard culture media to diagnose UTI and urinalysis was done using rapid dipstick. A total of 247 pregnant women were enrolled, of these

78 (31.5%) were symptomatic and 169 (68.4%). The prevalence of bacteriuria among symptomatic and asymptomatic pregnant women were 17.9% and 13.0% respectively (21).

Based on the study under taken in Egypt result revealed that the frequency of UTIs during pregnancy was 32%, with 63.3% of them having moderate infection. As UTIs being more significant among women with an intermediate socioeconomic score (37.9%) and unsatisfied personal hygiene, positive history of diabetes mellitus, anemia, and past history of UTI were found to be the major associated risk factors (22).

Moreover, in studies conducted by Hamdan in Sudan (23), Mordi RM. in Nigeria (24) and Turpin study in Ghana (25), *E. coli* was the main cause of UTIs among women of those areas and the prevalence in those regions were 41.5%,21% and 7.3%, respectively.

Based on the study under taken in Niger and Cameroon reveled the prevalence of UTI to be 75% (26) and 23.5 % (27) respectively. Similarly, among women attending antenatal care study conducted in Goba and Sinana the overall prevalence of UTI was 44/169 (26%) with 18/51 (35.3%) in symptomatic and 26/118 (22%) in asymptomatic pregnant women, respectively. And significant bacteriuria was associated with low educational status (28).

A systemic review and meta-analysis was performed using different study characteristics regarding to regional burden, as a result in SNNP region with prevalence of 22.2%, in Amhara regional state of Ethiopia which was 11.6%, in Tigray 16.3% and in AA 13.09% of pregnant women were diagnosed with UTI. In addition, studies published before 2015 reported 12.2% of UTI among pregnant women whereas studies published after 2015 and after evidenced that 18.8% of UTI among pregnant women. The pooled prevalence of UTI among studies having less 250 sample size was 14.5% whereas studies with sample size of more than 250 indicated 16.4% of UTI among pregnant women (29).

A cross-sectional study that was carried out on 170 pregnant women infected by the disease and referred to antenatal clinic at five primary health care centers in al-sadder City and the outpatient visitors to (Ibn AL-Bald maternity and children's hospitals) and the study revealed that educational status, maternal age and multiparty had a significant association with development of UTI.(30)

CHAPTER THREE

OBJECTIVE

3.1 GENERAL OBJECTIVE

- To determine Prevalence of urinary tract infection and its associated factors among pregnant women attending antenatal care at Wolkite University specialized hospital from March 22 to April 22 ,2014 E.C

3.2. SPECIFIC OBJECTIVE

- To determine the prevalence of UTI among pregnant women attending antenatal care at Wolkite University specialized hospital from March 22 to April 22 ,2014 E.C
- To assess factors associated with UTI among pregnant women attending antenatal care at Wolkite University specialized hospital from March 22 to April 22 ,2014 E.C

CHAPTER FOUR

4. METHODS AND MATERIALS

4.1 STUDY AREA

The study was conducted at WKUSH, located in Gurage zone Wolkite town south west Ethiopia. Wolkite is one of the developing towns in Ethiopia with total population of about 28,856 based on 2007 census conducted by Central Statistical Agency of Ethiopia. The town is located 192km from Addis Ababa to the south west and the hospital is situated around 10km away from Wolkite town. Geographically the hospital is located in Gubre kebele south west Ethiopia and currently it is a hospital with a good beginning as a new health center and believed to be one of the biggest hospitals in Ethiopia. The hospital started delivering service in 2012E.C. The hospital serves 4 zones with 4,000,000 total cluster population, in which 2,040,000 are females. It has a bed capacity around 25 for delivery service with more than 1000 deliveries a year and average number of 15-20 patients admitted in the ward daily. About 350 pregnant women visit the emergency laboratory to get a laboratory service related to antenatal care in month.

4.2. STUDY DESIGN

A Hospital-based cross sectional study was carried out from March 22 to April 22 ,2022

4.3 POPULATION

4.3.1 SOURCE POPULATION

Pregnant women at WKUSH.

4.3.2 STUDY POPULATION

Pregnant women attending ANC in WKUSH and who were willing to participate in the study.

4.4 ELIGIBILITY CRITERIA

4.4.1 INCLUSION CRITERIA

- Those women who reached at the second and third trimester pregnancy stage and volunteered to participate in the study.

4.4.2 EXCLUSION CRITERIA

- Women that are not pregnant and pregnant women that are not attending ANC at particular hospital but presented for other service at the hospital.
- Pregnant women with viral infection that result in immunosuppression such as HIV and HBV.

4.5 SAMPLE SIZE AND SAMPLING TECHNIQUE

4.5.1 SAMPLE SIZE

The sample size was determined by using single population proportion. Sample size determination formula at 95% confidence interval with 5%marginal error was used to calculate as follow:

$$n = \frac{(z\alpha/2)^2 P(1-P)}{d^2} = \frac{(1.96)^2 0.225(1-0.225)}{(0.05)^2} = 268$$

N=sample size

P=estimated prevalence (29)

D=margin of error to be tolerated

Z=value corresponding to 95%confidance interval 1.96

4.5.2 SAMPLING TECHNIQUE

Convenience sampling technique was employed.

4.6 STUDY VARIABEL

4.6.1 DEPENDENT VARIABLE

- Prevalence of UTI

4.6.2 INDEPENDENT VARIABLE

- Age
- Residence
- Educational status
- Income
- Parity
- Occupation

4.7 DATA COLLECTION INSTRUMENT AND TECHNIQUE

4.7.1 DATA COLLECTION INSTRUMENT

Structured questionnaires, Microscope, centrifuge, clean slide with cover slip, dipstick, Urine cup, Pasteur pipette, conical test tube and glove.

4.7.2. DATA COLLECTION TECHNIQUE

During implementation of data collection, the study subjects were asked for their willingness in participation of study. The required information was collected by using structured questionnaire. The questionnaire was translated first to Amharic language then after the completion of filling questionnaire random urine sample was collected from study units for laboratory test. Then laboratory determination of UTI was performed.

4.8 OPERATIONAL DEFINITION

UTI positive: The results were perceived as positive **either** nitrate positive (detected by Urine chemical test) plus presence of bacteriuria observed by urine microscopy **or** leukocyte positive (detected by urine chemical test) plus presence of pyuria more than normal range (>5 WBCs/ml) observed by urine microscopy. Symptom was also considered along with the results.

Also nitrate positive + leukocyte positive + presence of bacteriuria and pyuria results were taken as UTI positive.

Nitrate positive: any amount of uniform pink to red color

Leukocyte positive: dark tan to purple color **(**+1- +4).

Pyuria: presence of WBC in urine greater than 5 per high power field

Bacteriuria: presence of any number of bacteria in urine per high power field in symptomatic patient and 5+ (which is equivalent to 100,000 CFU/ml) in asymptomatic patients.

4.9 DATA PROCESSING AND ANALYSIS

After proper identification and assembly of materials needed for specimen collection, random urine sample was received from study units and the urine was examined physically first checking for presence of turbidity. Then chemical test proceeded by placing the dipstick into the urine sample and the result for Nitrate and Leukocyte was recorded observing the color change comparing to the color blocks on the color chart according to the recommended seconds which are 60 and 120 seconds respectively. After that the urine sample was poured in to conical test tube and centrifuged at 3500rpm for 10 minutes and the tube was taken out of the centrifuge and inverted at 90^0 to discard the supernatant leaving the sediment. Then the drop of the sediment was placed on a clean slide carefully and mounted with coverslip. The slide then was examined under microscope for presence of WBC & RBC above normal range and Bacterial cells /HPF.

4.10 DATA QUALITY CONTROL

Pre-analytical, analytical and post analytical quality control was done for laboratory test to ensure the reliability of result and SOP was followed throughout the process. To reduce misleading answers, the purpose of the study was informed to the study participants.

4.11 STATISTICAL ANALYSIS

The data were first coded, entered and cleaned using with manual method and some others were checked with scientific calculator, then it was analyzed. The socio demographic characteristics and other factors of respondents were analyzed by descriptive statistics. Bivariate logistic regression analysis was performed to identify the association of each independent variable with

the outcome variables. All variables with a probability value of ≤0.20 at bivariate logistic regression analysis were entered into the multivariate logistic regression model to control the possible effect of confounders. A probability value of less than 0.05 was considered statistically significant. Results were presented in the form of tables using frequency and summary statistics such as mean and percentage to describe the study population in relation to relative variables and discussed in the context of previous results.

4.12 ETHICAL CONSIDERATION

Written consent letter was obtained from WKUCMHS Department of Medical Laboratory, which then was given to the Hospital's Medical Director. Then the study participants were asked for their willingness after being fully informed about the evaluation, as a result those willing to impart was included in the evaluation. Confidentiality and anonymity of research respondents was respected. The study participant's result was reported to the physician for proper management.

4.13 DISSEMINATION OF RESULT

The findings of the study will be disseminated to the concerned body including WKUSH administration in order to inform the prevalence of UTI among pregnant women attending ANC at the hospital. Also, it will be presented to Wolkite University College of medicine and health science department of medical laboratory. Attempts will be made to publish.

CHAPTER 5

RESULT

Socio-Demographic characteristics

A total of 268 pregnant women participated in the study .of the total participants majority of them were in between age group 21-25 years (49.6%) followed by age group 26-30 years (33.2%), while the age group 36-40 years had the lowest frequency; 44.8% were secondary school graduates and 63.3% were in low socio-economic status.

Table 1: Socio demographic characteristics of pregnant women attending ANC at WKUSH in 2022

Variables	Response	Frequency	Percent
Maternal age	16-20	13	4.9
	21-25	133	49.6
	26-30	89	33.2
	31-35	29	10.8
	36-40	4	1.5
Residence	Urban	161	60.4
	Rural	107	39.6
Education	Illiterate	43	11.9
	Primary	22	13.8
	Secondary	125	44.8
	Higher learning	78	29.5
Occupation	H/wife	112	41.8
	Gov. employed	56	20.9
	Private sector	47	17.5
	Farmer	46	17.2
	Student	7	2.6
Income	<1000	119	44.9
	>1000	149	55.6

Parity	<3	216	80.6
	>3	52	19.4
Total		268	

Two hundred and sixty-eight (268) urine samples were collected and analyzed during the study period. Sixty (60) samples showed presence of UTI as a result the prevalence amounted to 22.4% as displayed in the next figure.

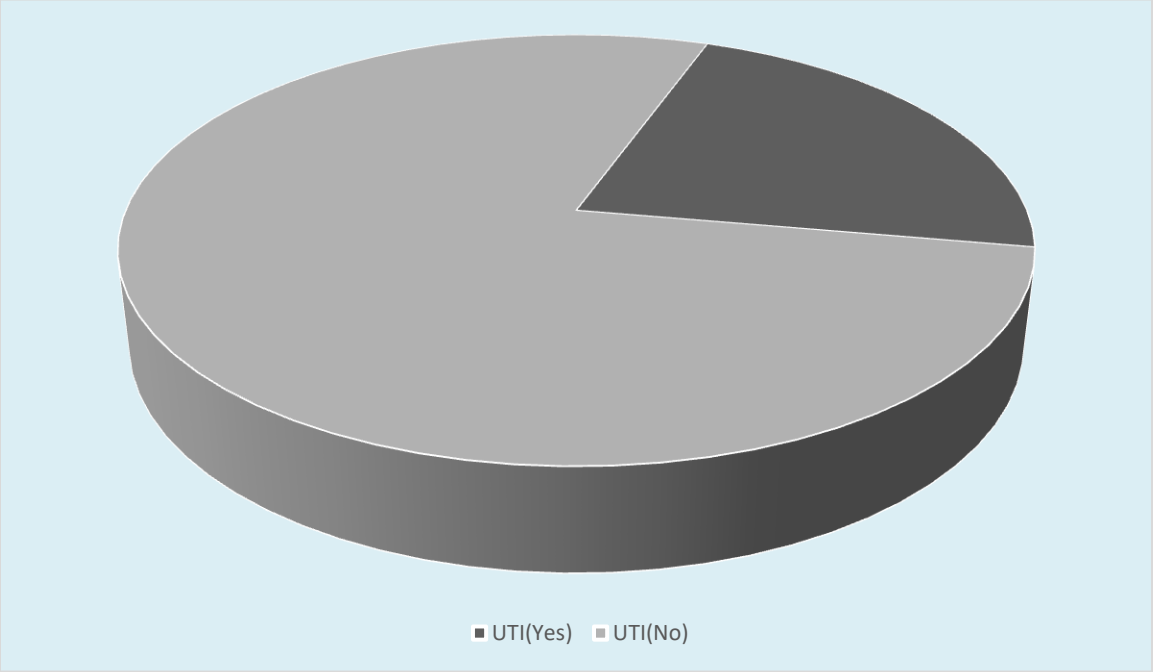

Fig. 1 Prevalence of Urinary Tract Infection

Among independent variables analyzed in bivariate logistic regression to know their association, variable which were significant at p< 0.2 were Education, Residence, Income, Parity and Age. And after entering those candidates into multivariate logistic regression only 3 were significantly associated with UTI. These are Education, Income and Parity. Those participants who had lack of education had 16 times more likely susceptible to UTI than who were educated. Pregnant women who have children >3 were about 11 times more susceptible to UTI than who have children<3. Pregnant women who were in low socio-economic status were 3 times more susceptible to acquire UTI than others. (Table 2)

Table 2: Binary and multivariable logistic regression of respondent with UTI among pregnant women attending ANC at WKUSH in 2022

Variable		UTI		COR	P-value	AOR	P-value
n = 268		yes	No				
Education	Illiterate	43(71.1%)	22	21.3	0.000	16.4	0.000
	Literate	17(28.3%)	186	1		1	
Residence	Urban	16(26.7%)	145	1		1	
	Rural	44(73.3%)	63	6.329	0.000	0.825	0.704
Income	<1000	38(63.3%)	81	2.708	0.001	3.146	0.007

	>1000	22(36.7%)	127	1		1	
Parity	<3	24(40%)	192	1		1	
	>3	36(60%)	16	18.000	0.000	10.786	0.000
Age	18-25	20(33.3%)	126	1		1	
	26-40	40(66.7%)	82	3.073	0.000	0.310	0.06

*significant at P≤0.05

CHAPTER 6

DISCUSSION

The overall prevalence of UTI among pregnant women in our study was 22.4%(as it is demonstrated on Fig.1), which is similar to Akinloye et al,(32) who reported a prevalence of 21.7% .The result is also nearly similar to the prevalence of UTI (26%) among pregnant women declared by the study conducted in Goba and Sinana Woreda(30). But our study finding shows disagreement with the finding of study conducted by Yadav LK and Yadav RL (19), which reported prevalence of 51.83%. These differences may be as a result of the different locations in which these studies were being carried out and difference in method of diagnosis.

Table (2) displayed that lack of education had been significantly associated with UTI among pregnant women. Majority of them were illiterate, who do not have a clue about UTI. The study conducted by S. Taye (30) also revealed that lack of educated had been significantly associated

with UTI, showing similarity with our study. Also, a study conducted In Baghdad agree with our finding that a lack of education has significant association with development of UTI.

Pregnant women who were identified to be UTI positive being in poor socio-economic status were more than half of women identified to be UTI Positive (38 out of 60). Income had been significantly associated with developing the UTI, this result had similar observation with study done in two private tertiary Medical Collage Hospital of Dhaka. (34)

Multiparty was significantly associated with developing UTI among pregnant women in our study, which agree with study conducted by lecturer Shatha Ahmed Mohammed Ali (31) which reported that multiparty is a risk factor for acquiring bacteriuria in pregnancy. Other study done by Manjula N.G. (33) also has the same finding that confirm multiparty has significant association with development of UTI among pregnant women.

CONCLUSION

We concluded that UTI remain a conventional problem during pregnancy based on the findings of this study. As the physiological changes of pregnancy predispose women to UTI so does other factors suggested by our study such as lack of education, multiparity and low socio-economic conditions.

LIMITATIONS

This is a short period study and random urine sample was used for examination. In order to generalize and assess the prevalence more reliably the time period has to be increased and first morning urine has to be examined.

RECOMMENDATION

- We recommend that all pregnant women should be screened for UTI during their pregnancy, which is better to control before it costs more.

- we also recommend for pregnant women whose result became positive should be treated immediately with antibiotics and then retested for cure because early diagnosis and treatment of UTI during pregnancy prevent UTI related maternal and perinatal morbidity.
- We recommend health education provision for pregnant women specifically about UTI and its symptoms in order to enable them to complain early when they feel the symptoms, which is preferable to manage, and methods to reduce its chance of occurrence.

REFERENCES

1.ANON, (2006). Urinary tract infection in women. http://familydoctor.og/online/famdocen/home/women/gen-health/190/html.

2.Delzell JE, Lefevre ML. Urinary tract infections during pregnancy. American Family Physician. 2000;61(3):713-21

3. Orenstein Wong ES. Urinary tract infections in adults. American Family Physician. 1999;59(5):1225-37

4 ADULT HEALTH ADVISORS (2005). Bacterial in Urine, do symptoms. (http://www.med.umich.ed. /llibr/aha/ahaasybaccris.htm)

5 THOMPSON, T. (2006). Urinary Tract Infection Medication: Antibiotics for UTI. http://www.nativeemedies.com/articles/urinary-tract-infection-medication-antibioticsuti. html.

6. Emilie Katherine Johnson, MD, Edward David Kim, MD, FACS. UTIs in pregnancy. Update: March 29, 2011.

7.JANICE, K. (2006). Urinary tract infection – causes and prevention: the natural way. http://www.janicehealth.com/uti.htm

8.Totsika M, Moriel DG, Idris A, Rogers BA , Wurpel DJ,Phan MD,et al.uropathogenic Escherichia coil mediated urinary tract infection. Curr Drug Targets.012;13(11):1386-99.[pub med][Google scholar]

9. Akerele, J Abhlimen, P, and Okonofua, F. Prevalence of asymptomatic Bacteriuria among pregnant womenin Benin

City, Nigeria.British Journal of Obstetrics and Gynaecology.2002; 221 (2). 141-144

10. Onuh, S O, Umeora, O U J, Igberase, Go, Azikem M E and Okpere, E E. Microbiological Isolates andsensitivity pattern of

urinary tract infection in pregnancy in Benin City, Nigeria,Ebonyi Medical Journal.2006; 5(2); 48 –52.

11. Farooqui HS. Prevalence of Urinary Tract Infection in Antenatal cases: A Prospective Hospital Based Study.

12. A. Tadesse, M. Negash, and L. Ketema, "Asymtomatic bacteriuria in pregnancy: assesment of prevlence, microbial agents and ther antimicrobial sensitivty pattern in Gondar Teaching Hospital, north west Ethiopia," Ethiopian Medical Journal,vol. 45, no. 2, pp. 143–149, 2007.

13. A. K. Nisha, A. E. Etana, and H. Tesso, "Prevalence of asymptomatic bacteriuria during pregnancy in Adama city, Ethiopia,"Int J Microbiol Immunol Res, vol. 3, pp. 58–63, 2015.

14.Giraldo PC, Araujo ED, Junior JE, Amaral RLGD, Passos MRL, Goncalves AK. The prevalence of Urogenital Infections In pregnant Women Experiencing preterm and full- term Labor.Infect Dis Obstetrics Gynecol.

012;2012:1-4. Doi: 10.1155/2012/878241. [PMC free article] [Pub Med] [cross Ref] [Google scholar]

15. Amiri M, Lavasani Z, Norouzirad R, Najibpour R, Mohamadpour M, Nikpoor AR, Raeisi M, Marzouni HZ. Prevalence of urinary tract infection among pregnant women and its

complications in their newborns during the birth in the hospitals of Dezful city, Iran, 2012-2013. Iranian Red Crescent Medical Journal. 2015 Aug;17(8)

16. SoleimaniZadeh LD, Basri N, Abaszadeh A, Arab M. [Assessment of high-risk pregnancy in Bam Mahdieh maternity hospital, 2002.]. *J ShahrekordUniv Med Sci.* 2004;**6**(2):67–73.

17. Mobbasheri ET, Ghaemi E, Moujloo M, Vakili MA. [Prevalence of bacteriuria during pregnancy in Gorgan, Iran]. *Gorgan Medical Journal.* 2001; **9:42**–7.

18.. Yadav K, Prakash S. Prevalence of Asymptomatic Bacteriuria during Pregnancy at a Tertiary Care Hospital of Province No. 2, Nepal. Tribhuvan University Journal of Microbiology. 2019 Dec 6; 6:32-8

19. Dutta DC (2008). DC Dutta's textbook of Obstetrics and Gynecology. 6thed: New central book agency.

20. Rhode S, dos Santos JC, Dam RI, Ferrazza MH, Tenfen A. Prevalência de infecção urinária em gestantes atendidas por unidade básica de saúde em Jaraguá do Sul, SC-Brasil. Brazilian Journal of Development. 2021 Jan 20;7(1):7035-47

21. Masinde A, Gumodoka B, Kilonzo A, Mshana SE. Prevalence of urinary tract infection among pregnant women at Bugando Medical Centre, Mwanza, Tanzania. Tanzania journal of health research. 2009;11(3)

22. Shaheen HM, Farahat TM, Hammad NA. Prevalence of urinary tract infection among pregnant women and possible risk factors. Menoufia Medical Journal. 2016 Oct 1;29(4):1055

23. Hamdan HZ, Ziad AH, Ali SK, Adam I. Epidemiology of urinary tract infections and antibiotics sensitivity among pregnant women at Khartoum North Hospital. *Ann Clin Microbiol Antimicrob.* 2011;**10**:2.

24.Mordi RM, Burke ME, Odjadjare EE, Enabulele SA, Umeh OJ. Prevalence of urinary tract infections (UTI) among pregnant women in university of Benin teaching hospital (UBTH) Benin city, Nigeria. Journal of Asian Scientific Research. 2015 Apr 15;5(4):198-204

25. Turpin C, Minkah B, Danso K, Frimpong E. Asymptomatic bacteriuria in pregnant women attending antenatal clinic at komfo anokye teaching hospital, kumasi, ghana. *Ghana Med J.* 2007;**41**(1):26–9.

26. Adabara NU, Momoh JA, Bala JD, Abdulrahman AA and Abubakar MB (2012). The prevalence of bacterial urinary tract infections (UTI) among women attending antenatal clinic in the general hospital, Minna in Niger state. *IJBR* **3**(3)**:** 171-173.

27.Mokube MN, Atashili J, Halle-Ekane GE, Ikomey GM and Ndumbe PM (2013). Bacteriuria amongst pregnant women in the Buea hospital district, Cameroon: Prevalence, predictors, antibiotic susceptibility patterns and diagnosis. *PLoS ONE***8**(8)**:** e71086.

28. Taye S, Getachew M, Desalegn Z, Biratu A, Mubashir K. Bacterial profile, antibiotic susceptibility pattern and associated factors among pregnant women with Urinary Tract Infection in Goba and Sinana Woredas, Bale Zone, Southeast Ethiopia. BMC research notes. 2018 Dec;11(1):1-7.

29. Getaneh T, Negesse A, Dessie G, Desta M, Tigabu A. Prevalence of Urinary Tract Infection and Its Associated Factors among Pregnant Women in Ethiopia: A Systematic Review and Meta-Analysis. BioMed Research International. 2021 Dec 1;2021

30. Ali SA, Sajem KG. Urinary Tract Infection as a Health Problem among Pregnant Women in Baghdad AL Sadder City. Al-Mamon Coll J. 2018; 31:267-81.

32. Akinloye O, Ogbolu DO, Akinloye OM, Terry Alli OA. Asymptomatic bacteriuria of pregnancy in Ibadan, Nigeria: a re-assessment. British journal of biomedical science. 2006 Jan 1;63(3):109-12.

33. Manjula NG, Math GC, Patil A, Gaddad SM, Shivannavar CT. Incidence of urinary tract infections and its aetiological agents among pregnant women in Karnataka region. Advances in Microbiology. 2013 Oct 18;2013.

34. Parveen K, Momen A, Begum AA, Begum M. Prevalence of urinary tract infection during pregnancy. Journal of Dhaka National Medical College & Hospital. 2011;17(2)

ANNEX I

REQUIRED MATERIAL AND LABORATORY TEST PROCEDURE

- ✧ Equipment and Materials:
- ✧ Microscope
- ✧ Microscopic slide
- ✧ Centrifuge
- ✧ Conical test tube
- ✧ Urine cup
- ✧ Dipstick
- ✧ Glove

General Principle of dipstick

Reagents are activated when the test strip is dipped in to urine. The chemical strips change color if certain substances are present or if their levels are above typical level.

Principle of leukocyte detection

Pyuria can be detected using the leukocyte esterase reagent strip test based on detection of esterase, which is directly proportional to the number of leukocytes present in a urine sample. The basis of chemical reaction is the hydrolysis of an ester to form an aromatic alcohol and acid. The aromatic compound combines with a diazonium salt to form an azo-dye that changes to purple. Color intensity read to two minutes is proportional to number of granulocytes in a sample.

Principle of nitrite detection

Bacteriuria can be detected using nitrite test. The reaction principle is based on bacterial reduction of dietary nitrate, which is normally present in urine, to nitrite, which is not normally present. Nitrite reacts with para-arsanilic acid on the dipstick to form a diazonium compound that reacts with a benoquinoline to form a pink color.

Test procedure (dipstick)

1. Check if name of patient and name on request matches
2. Dip the reagent strip briefly into the urine specimen.
3. remove the strip and hold in a horizontal position to prevent mixing of chemicals from adjacent reagent areas.
4. Compare the test areas for nitrate and leukocyte with the color chart supplied by the manufacturer.
5. Report the result as positive or negative for nitrate and use grading system for leukocyte, pH and albumin.

Test procedure (microscope)

1. Pour the urine sample in to clean conical test tube

2. Centrifuge the tube at 3500rpm for 10 minutes
3. Take the tube out of the centrifuge and invert it at 90^0 to discard the supernatant leaving the sediment.
4. Then place the drop of the sediment on a clean slide carefully and mount with coverslip.
5. Examine the slide under microscope for presence of WBC & RBC above normal range and Bacterial cells /HPF (40x).

College of health science

Department of Medical Laboratory Science

Questionnaire to determine the prevalence of urinary tract infection among pregnant women of ANC attendant

Hello, my name is----------may I talk with you for a few minutes? I'm graduating student from Wolkite university and I am conducting small study on UTI. Everything we will discuss will be treated confidentially. I will ask you some questions, and at the end we will collect random urine sample for laboratory test. Would you mind participating?

Questionnaire

MRN----------

Questionnaire no ----------

I. Socio demographic characteristics

1. Age ----------
2. Ethnicity
   - SNNPR
   - Amhara
   - Oromia
   - Other/Specify

3.Religion

- Orthodox
- Muslim
- Protestant
- Other /specify

3. Income
   - <1000
   - >1000
4. Occupation
   - H/wife
   - Gov. employed
   - Private
   - Daily labor

- Student

5. Educational status
    - Illiterate
    - Primary
    - Secondary
    - Higher education graduate
6. What symptoms do you get with a urine infection?

- Burning and/or stinging when passing urine
- Burning and/or stinging after passing urine
- Passing urine frequently
- Frequent urination
- Pains in abdomen/tummy
- Pains in back
- Fever
- Not listed above (please describe below)

7. How many times did you experienced the above symptoms previously?
    - Often
    - Sometimes
8. Hygiene behavior (while latrine usage):

- with water
- without water

9. Number of childbirths_____

II. Others questions

- Laboratory result

1. Chemical test result (dipstick)

Nitrate

Leukocyte

PH

2 Microscopic finding

WBC/HPF

RBC/HPF

BACTERIA/HPF

Thank you for completing this questionnaire

DECLARATION

This is to declare that this research paper is done under the guidance of Bisrat Fikadu and Mihret alemayehu , having the Title prevalence of urinary tract infection and its associated factor among pregnant women attending antenatal care at WKUSH by Tsion Fikre, Mitku Gebre, Edelu Tere and Mubarik Faris.

Date: _____

Group Members:

Full name Signature

1. Tsion Fikre_____

2. Mitku Gebre_____

3. Edelu Tere_____

4. Mubarik Faris

APPROVAL FORM

This is to confirm that the research conducted entiteled prevalence of urinary tract infection and its associated factors among pregnant women attending antenatal care at WKUSH. Submitted to Wolkite university college of Medicine and Health Science Department of Medical Laboratory By: Tsion Fikre,Mitiku Gebre, Edelu Tere and Mubarik Faris is Approved for submission.

---------- ---------- ----------

Advisor Name Mihret Alemayehu(Assistant Professor)

Date Signature

---------- ---------- ----------

Department Head Name Daniel K.(Assistant Professor)

Date Signature

---------- ---------- ----------

Examiner 1 Name

Date Signature

---------- ---------- ----------

Examiner 2 Name

Date Signature

---------- ---------- ----------

Examiner 3 Name

Date Signature