



# International Journal of Multidisciplinary Research and Growth Evaluation



International Journal of Multidisciplinary Research and Growth Evaluation

ISSN: 2582-7138

Received: 06-05-2021; Accepted: 26-05-2021

www.allmultidisciplinaryjournal.com

Volume 2; Issue 3; May-June 2021; Page No. 505-508

## Prevalence of UTI among pregnant women in Gashua, Nigeria

Kolo RL <sup>1</sup>, David IJ <sup>2</sup>

<sup>1</sup> Department of Biological Science, Federal University, Gashua-Nigeria

<sup>2</sup> Department of Mathematics and Statistics, Federal University Wukari, Nigeria

Corresponding Author: **Kolo RL**

### Abstract

Urinary tract infection (UTI) is one of the most frequently encountered problems facing the family physician. This work was aimed at determining the prevalence of UTI among pregnant women who go for antenatal at General Hospital Gashua, Yobe State, Nigeria. Urine culture was performed to isolate and identify the organisms present on Cysteine-Lactose Deficient and MacConkey Agar after which biochemical tests were carried out. A total of 145 pregnant women were admitted for the study out of which 101 (69.6%) were positive for UTI and 44 (30.4%) negative. Women of 26-30 years age group had the highest prevalence of 38.6%,

women with informal education had the highest prevalence of 55.4%. Based on the occupation, housewives had the highest prevalence of 79.2% and women in their third trimester of pregnancy had prevalence of 50.5%. Five organisms were isolated (*E. coli*, *Klebsiella*, *Pseudomonas*, *Proteus*, and *Staphylococcus aureus*) of which *E. coli* had the highest prevalence of 39.6%. The result suggest that there is high prevalence of UTI among pregnant women in the study area due to exposure of causative organisms. Early diagnosis and treatment of UTI during pregnancy can ensure the safety of mother, fetus and prevent complications during delivery.

**Keywords:** Urinary tract infection, pregnant women, Prevalence, Urine culture, Isolates

### 1. Introduction

Urinary tract infection (UTI) is one of the most frequently encountered problems facing the family physician <sup>[1]</sup>. It is an infection caused by the presence and replication of microorganisms in the urinary tract. It is the single most common bacterial infection of mankind <sup>[2, 3]</sup>.

Urinary tract infection (UTI) is any infection that affects any part of the urinary tract. Although urine contains a variety of fluid, salt and waste product, it usually does not have bacteria on it. When bacteria get into the bladder or kidney and multiply in the urine they cause UTI. More than 50% of women suffer at least one incidence of UTI during their lifetime <sup>[4]</sup>.

Urinary tract infection is mainly caused by gram-negative organisms that include *E. coli* 60-70%, *Klebsiella* 10%, *Proteus* 5-10%, and *Pseudomonas* 2-5% and gram-positive bacteria, *Staphylococcus species* <sup>[5]</sup>. The gram-positive pathogens are *Streptococcus species* and *Staphylococcus species* <sup>[6, 7]</sup>.

Urinary tract infections (UTIs) represent the most common bacterial infection in pregnant and non-pregnant women <sup>[8, 9]</sup>. UTIs during pregnancy are among the most common health problems worldwide, especially in developing counties. In Egypt, the prevalence of UTIs during pregnancy ranges between 22 and 35% <sup>[10]</sup>.

An interesting fact is that UTI in pregnancy increases during the gestational period. It begins from the sixth week of the first trimester and peaking in the 22nd to 24th week of the second trimester <sup>[11]</sup>. At this period, approximately 90% of pregnant women develop ureteral dilatation which remains until delivery, leading to increase in bladder volume and decreased bladder and ureteral tones, causing increase in urinary stasis and ureterovesical reflux <sup>[11]</sup>. The main factors predisposing married women to bacteriuria are pregnancy and sexual intercourse <sup>[12]</sup>.

Sexual activity increases the chances of bacterial contamination of female urethra. Having intercourse may also cause UTIs in non-pregnant women because bacteria can be pushed into the urethra. It may be symptomatic, in form of urethritis, cystitis, pyelonephritis; or it may remain asymptomatic. UTI was said to be about 4-10 times more common in pregnant than in the non-pregnant women <sup>[13]</sup>. The reason is that during pregnancy, there is a change in urine chemical composition with increase in glucose and amino acids which facilitate bacterial growth in urine <sup>[14]</sup>. The high frequency experienced is also due to physiological, anatomical, and functional changes that occur in the urinary tract during pregnancy.

When UTI affects the lower urinary tracts, it is known as cystitis and when it affects the upper urinary tracts, it is known as pyelonephritis.

It is more common in women than in men due to their short urethra, promoting ascending infection to the bladder (cystitis) and occasionally the kidney. Urinary Tract Infection occurs more frequently in developing countries among the low socioeconomic populations. According to findings from [8], prevalence rate of UTI in pregnant women in America to be 2.5–8.7% whereas [15] estimated the prevalence of UTI in pregnant women to be 12–40% in developing countries. This was due to the differences in the socioeconomic levels and standards of living [11].

This work is aimed at investigating the prevalence of UTI among pregnant women attending general hospital Gashua, Yobe State, Nigeria. Also, to isolate and identify the organisms associated with UTI among the pregnant women in the target population.

**2. Study area and subject**

The study was carried out in General Hospital Gashua Yobe State, Nigeria at Department of Medical Laboratory Parasitology/Microbiology unit. Gashua is a city found in Bade Local Government Area of Yobe State, in North-Eastern Nigeria. It is located 12.87 latitude and 11.04 longitude and it is situated at elevation 339 meters above sea level.

All pregnant women (subject) that came for antenatal at the General Hospital Gashua, Yobe State, Nigeria during the course of this study were recruited for the study. A total of One hundred and forty five (145) urine samples were

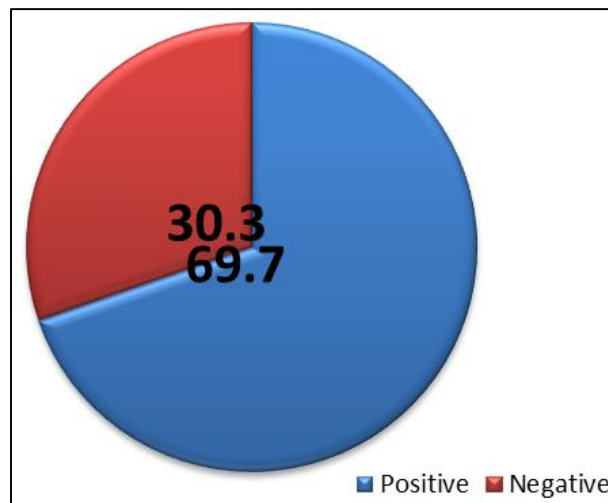
collected and analyzed. Ethical clearance was obtained from the Medical Ethical and Scientific Committee of the General Hospital Gashua, Yobe State before the commencement of this work. Also consent was sought from the participants. Only those who gave their consent were recruited in this study.

**3. Sample collection and laboratory analysis**

Early morning mid-stream urine samples of about 10 ml were collected from pregnant women complaining of urinary tract infection using clean and sterilized plastic bottles with airtight screwdriver cap tops. A total of 145 midstream urine samples were collected from pregnant women. The urine samples were inoculated on freshly prepared Cysteine-Lactose Deficient (CLED) and MacConkey agar. The plates were incubated at 37°C for 24 hours to isolate the growing microorganisms. Representative of growing colonies were re-inoculated onto the surface of Nutrient Agar Slant. The resulting pure colonies obtained were Gram stained and used for biochemical tests which includes indole, citrate utilization, catalase, urease, Triple sugar Iron agar (TSIA) oxidase, and coagulase test.

**4. Findings and Discussion**

In this section, the results from laboratory analysis and descriptive distribution of the results are presented and discussed.



**Fig 1:** Percentage prevalence of UTI among pregnant women

Out of the 145 midstream urine samples collected from the pregnant women, 101 (69.7%) of them were found to be positive for UTI while 30.3% tested negative to UTI. Figure 1 shows a pie chart representation of the outcome. Descriptive analysis on some demographic parameters was performed. The subjects were categorized based on age,

educational level, occupation and trimester. In relation to age, the result in Table 1 showed that women in the age group 26-30 years had the highest prevalence of 39 (38.6%) and the least prevalence was recorded in the age group of 16-20years 12 (11.9%).

**Table 1:** UTI Prevalence in Pregnant Women at Different Age Groups

Age (years)	Number Examined	Positive (%)
16-20	18	12 (11.9)
20-25	22	15 (14.9)
26-30	58	39 (38.6)
31-35	27	19 (18.8)
36-40	20	16 (15.8)
<b>Total</b>	145	101(100)

Analysis done based on the women's level of education revealed from Table 2 that women with tertiary education had the lowest prevalence of 5 (5.0%) compared to women with informal education with the highest prevalence of 56 (55.4%). Women with primary and secondary education had a prevalence rate of 21 (20.8%) and 19 (18.8%) respectively.

**Table 2:** UTI Prevalence in Relation to Education Status among Pregnant Women

Educational status	Numbers examined	Positive (%)
Informal education	68	56 (55.4)
Primary	36	21 (20.8)
Secondary	26	19 (18.8)
Tertiary	15	5 (5.0)
Total	145	101 (100)

In relation to occupation, results presented in Table 3 showed that women who are house wives had the highest prevalence of 80 (79.2%) and lowest prevalence observed in women who were civil servants 2 (2.0%). Women who are students and do business had prevalence of 6 (5.9%) and 13 (12.9%) respectively.

**Table 3:** UTI Prevalence in Relation to Occupation among Pregnant Women

Occupation	Number Examined	Positive (%)
House wives	101	80 (79.2)
Business	22	13 (12.9)
Student	12	6 (5.9)
Civil servant	10	2 (2.0)
Total	145	101 (100)

On the basis of trimester, the study showed from Table 4 that women in their first trimester had the lowest prevalence of 19 (18.8%) and highest among women in their third trimester 51 (50.5%), women in their second trimester had a prevalence of 31(30.7%).

**Table 4:** Prevalence of UTI in relation to trimester among pregnant women

Trimester	Number Examined	Positive (%)
1st	23	19 (18.8)
2nd	49	31 (30.7)
3rd	82	51 (50.5)
Total	145	101 (100)

The laboratory result as presented in Table 5 indicated that *Escherichia coli* are the most prevalent organism with prevalence of 40(39.6%), followed by *Klebsiella* with a prevalence of 20(19.9%), *Pseudomonas aeruginosa* 18(17.8%), *Proteus sp* 13(12.9%) and finally *Staphylococcus aureus* with prevalence of 10 (9.9%).

**Table 5:** UTI Prevalence Isolated Organisms among Pregnant Women

Organism Isolated	Occurrence	Percentage (%)
<i>Escherichia coli</i>	40	39.60%
<i>Klebsiella pneumonia</i>	20	19.80%
<i>Proteus Sp</i>	13	12.90%
<i>Pseudomonas aeruginosa</i>	18	17.80%
<i>Staphylococcus aureus</i>	10	9.90%
Total	101	100%

This study indicates that one hundred and one 101(69.7%) women out of one hundred and forty five were positive for Urinary Tract Infection (UTI). This can be due to the fact that UTI is common in the study area and most of the women must have been exposed to the causative organisms. The prevalence of UTI was consistent with study carried out in Karu, Nasarawa State, Nigeria which reported a prevalence of 62.67% in women attending some Primary Health Centers in the State [16]. This prevalence was higher than the one reported by [17] in a study amongst pregnant women in Kano State, Nigeria and found a prevalence of 15.8%.

The prevalence of UTI was highest in the age group of 26-30 years followed by 31-35 this could be due to the fact that Sexual activity and certain contraceptive methods are also said to increase the risk [18] and women are mostly sexually active at this age. This prevalence agrees with study by [17] who reported highest prevalence within the age group of 26-30 years.

Based on educational status, women with no formal form of education had a highest prevalence of 55.44%. This agrees with study done in Turkey by [10] and they found that the highest percentage of UTIs among pregnant women were among those who were illiterate (61.5%). On the basis of occupation, women who are house wives had the highest prevalence of 80 (79.20%) and this agrees with study carried out by [16].

Women in their third trimester of pregnancy had the highest prevalence of 51 (50.1%), this could be due to increased mechanical obstruction due to gravid uterus [19]. The pressure effect of a bigger uterus on the ureter at the third trimester, also the increasing smooth muscle relaxing effect of pregnancy hormones and pressure on the bladder from the descending part may lead to stasis of urine which can increase the multiplication of bacteria [16]. This result agrees with study carried out by [16] in Karu Nasarawa State.

From our study *Escherichia coli*, *Klebsiella*, *Pseudomonas aeruginosa*, *Proteus sp* and *Staphylococcus aureus* were organism isolated from the samples. Several studies conducted on prevalence of bacteria on urinary tract infection showed the presence of these organisms as the most dominant species [10, 17, 20]. Presence of members of Enterobacteriaceae family such as *E. coli*, *Klebsiella* and *Proteus* means that infection was as result of poor personal hygiene because the organisms were of fecal origin. This may also be connected with the proximity of anus to female vagina. The domination of Gram-negative UTI bacteria could be attributed to an increase in levels of amino acids and lactose during pregnancy that particularly encourages *E. coli* growth. It could also be due to infection by faecal contamination due to poor hygiene [21]. Also, [22] attributed the high prevalence of Staphylococcal infection to poor personal hygiene.

## 5. Conclusion

The study has revealed that the overall prevalence of UTI among pregnant women is 69.7% which indicated that UTI is common in the study area and most of the women must have been exposed to the causative organisms. There should be mass education and public awareness programs on the importance of proper personal hygiene and good environmental sanitation habits mostly during pregnancy; periodic screening should also be carried out on all pregnant women at the antenatal clinics for asymptomatic UTIs.

## 6. References

1. John ED, Michael LL. Urinary Tract Infections During Pregnancy University of Missouri-Columbia School of Medicine, Columbia. Missouri America Family Physician. 2000; 61(3):713-720.
2. Morgan MG, McKenzie H. Controversies in the Laboratory Diagnosis of Community Acquired Urinary Tract Infection. European Journal of Clinical Microbiological Information. 1993; 12(7):491-504.
3. Ebie M, Kandakai-Olukemi YT, Ayanbadejo J, Tanyigna KB. Urinary Tract Infection in a Nigerian Military Hospital. Nigerian Journal of Microbiology. 2001; 15(1):31-37.
4. University of Maryland Medical Center (UMMC), Urinary tract infection-risk factors, 2011. Available at: <http://www.umm.edu>. [Accessed 24 February 2021].
5. Alemu A, Moges F, Shiferaw Y, Tafess K, Kassu A, Anagaw B, Agegn A. Bacterial profile and drug susceptibility pattern of urinary tract infection in pregnant women at University of Gondar Teaching Hospital, Northwest Ethiopia. 2012; 5:197.
6. Assefa A, Asrat D, Woldeamanuel Y, Hiwot YG, Abdella A, Melesse T. Bacterial profile and drug susceptibility pattern of urinary tract infection in pregnant women at Tikur Anbessa Specialized Hospital Addis Ababa, Ethiopia, Ethiopian Medical Journal. 2008; 46(3):227-235.
7. Okonko IO, Ijandipe LA, Ilosanya OA, Donbraye-Emmanuel OB, Ejembi J, Udeze AO, *et al.* Incidence of Urinary Tract Infection (UTI) among pregnant women in Ibadan, South-Western Nigeria. African Journal of Biotechnology. 2010; 8(23):6649-6657.
8. Foxman B. Epidemiology of urinary tract infections: incidence, morbidity, and economic costs. Disease. Mon. 2003; 49(2):53-70.
9. Foxman B, Klemstine K, Brown P. Acute pyelonephritis in US hospitals in 1997: hospitalization and in-hospital mortality, Annals of epidemiology. 2003; 13(2):144-150.
10. Dimetry SR, El-Tokhy HM, Abdo NM, Ebrahim MA, Eissa M. Urinary tract infection and adverse outcome of pregnancy. Egypt Public Health Association Journal. 2007; 82:203-218.
11. Patterson TF, Andriole VT. Bacteriuria in pregnancy. Infectious Disease Clinics of North America. 1987; 1:807-822.
12. National Institutes of Health (NIH), What I need to know about Urinary Tract Infections. NIH Publication, 2004, 04-4807.
13. Schulman A, Herlinger H. Urinary tract dilatation in pregnancy. British Journal of Radiology. 1975; 48(572):638-645.
14. Njoku CO, Ezissi NH, Amandi AN. Observations on bacterial infection of urinary tract patients, International Journal of Environmental health and Human Development. 1998; 13(2):785-798.
15. Vazquez JC, Villar J. Treatments for symptomatic urinary tract infections during pregnancy. Cochrane Database of Systematic Reviews (Online). 2000; 3:CD002256.
16. Ajide B, Adogo L, Saidu H, Enna M. Prevalence of urinary tract infection among pregnant women receiving antenatal care in two primary health care centres in Karu Nasarawa State, Nigeria. British Medical Research Journal. 2016; 12(3):1-8.
17. Muhammad A, Muhammad AS. Prevalence of Urinary Tract Infection among Pregnant Women in Kano, Northern Nigeria. Archives of Reproductive Medicine and Sexual Health. 2019; 2(1):23-29.
18. Bandyopadhyay S, Thakur JS, Ray P, Kumar R. High prevalence of bacteriuria in pregnancy and its screening methods in North India. Journal of Indian Medical Association. 2005; 103:259-266.
19. Ranjan A, Srimath TKS, Matta N, Sumalatha C, Ansari RK. Urinary Tract Infection prevalence in pregnant women and complications in neonates. Indian Journal of Pharmacy Practice. 2017; 10(1):45-49.
20. Masinde A, Gumodoka B, Kilonzo A, Mshana SE. Prevalence of Urinary Tract Infection among pregnant women at Bugando Medical Center, Mwanza, Tanzania. Tanzania Journal of Health Research, 2009; 11(3):154-61.
21. Obiobolu CH, Okonko IO, Anyamere CO, Adedeji AO, Akanbi AO, Ogun AA. Incidence of urinary tract infections among pregnant women in Akwa Metropolis, Southeastern Nigeria. Science Research Essays. 2009; 4:820-824.
22. Nworie A, Eze UA. Prevalence and aetiologic agent of urinary tract infection in pregnancy in Abakaliki metropolis. Continental Journal of Medical Research. 2010; 4:18-23.