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Distribution of Urinary Tract Infection (Uti) Among Pregnant Women Attending Ante-Natal Care in Lokuwa Maternity Mubi North, Adamawa State-Nigeria

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Abstract

Urinary tract infections (UTI) during pregnancy is one of the most common public health problems worldwide, and that up to 10% of women will experience a symptomatic UTI at some time during their lifetime. *E.coli* is the cause of 80-85% of UTI with *Staphlococcus saprophyticus* being the cause in 5-10%. Urinary tract infection occur more commonly in women than men, with half having at least one infection at some point in their lives. This study aimed to assess the distribution of UTI among pregnant women attending ante-natal care at Lokuwa Maternity. A total of 100 samples were collected using simple random sampling method; 10 pregnant women were selected daily until sample size was reached. A standardized questionnaire was administered to each patient during a routine visit to the maternity that consented to obtain their socio-demographic information. Urinalysis 27-31 (45.5%) using dipstick was done following the manufacturer's instructions. A 5µl and 10µl plates were used to inoculate urine samples on MacConkey agar and the plates were incubated for 24hrs at 37ºC. For quality control, E.coli ATCC 25922 was used as control strains. Out of 100 sample collected, 48(48.0%) were infected, and these proved its wide distribution. Age group of 17-21 years had the highest distribution of 55.0% followed by 22-26 (50.0%)respectively and no (0.00%) infection was recorded in the age group ≥ 37 (0.0%). In this study, women in their 3rd and 2nd trimester were found to have the higher incidence of UTI 78.46 % and 12.31 % respectively. However, the Chi- square analysis revealed that there was no significance difference in infection based on age group (p≥ 0.05).

Keywords: Distribution, Urinary tract infection, pregnant women, Ante-Natal, Mubi

Introduction:

A urinary tract infection (UTI) is an infection that affects part of the urinary tract. When it affects the lower urinary tract it is known as a bladder infection (cystitis) and when it affects the upper urinary tract it is known as kidney infection (pyelonephritis) (Ahmed *et al.*, 2013). Symptoms from a lower urinary tract include pain during urination, frequent urination, and feeling the need to urinate despite having an empty bladder. Symptoms of a kidney infection include fever and flank pain usually in addition to the symptoms of a lower UTI (Ahmed *et al*., 2013). Rarely the urine may appear bloody. In the very old and the very young, symptoms may be vague or non-specific (Nicolle, 2010).

About 150 million people developed a urinary tract infection each year. The disease is more common in women than men. In women, it is the most common form of bacterial infection. Up to 10% of women have a urinary tract infection in a given year and half of women having at least one infection at some point in their lives. It occurs most frequently between the ages of 16 and 35 years, recurrences are common. (Salvatore *et al.*, 2011).

E. coli is the cause of 80–85% of community-acquired urinary tract infections, with *Staphylococcus saprophyticus* being the cause in 5–10% (Nicolle, 2010).). Healthcare-associated urinary tract infections (mostly related to urinary catheterization) involve a much broader range of pathogens including: *E. coli* (27%), Klebsiella spp (11%), *Pseudomonas aeroginosa* (11%), the fungal pathogen *Candida albicans* (9%), and Enterococcus (7%) among others (Sievert *et al.*, 2013). In young sexually

active women, sexual activity is the cause of 75–90% of bladder infections, with the risk of infection related to the frequency of sex (Ahmed *et al.*, 2013). The term "honeymoon cystitis" has been applied to this phenomenon of frequent UTIs during early marriage (Ahmed *et al.*, 2013). In post-menopausal women, sexual activity does not affect the risk of developing UTI. Spermicide use, independent of sexual frequency, increases the risk of UTIs (Barbar *et al.*, 2013). Women are more prone to Urinary Tract Infections (UTI) than men, because, in females, the urethra is much shorter and closer to the anus (Muhammed, 2015).

As a woman's estrogen levels decrease with menopause, her risk of urinary tract infections increases due to the loss of protective vaginal flora. Additionally, vaginal atrophy that can sometimes occur after menopause is associated with recurrent urinary tract infections (Muhammed, 2015).

Materials and Methods

Study Area

The study was carried out at Lokuwa Maternity, Mubi. Mubi is a town in Adamawa north senatorial District in Adamawa state, North-East of Nigeria with a coordinate of 10° 16″N, 13° 16″E. The people of Mubi engaged themselves in subsistence farming cattle or livestock farming, and only few are civil servants and businessmen. The climate is tropical with average temperature of about 32.90° C in dry season and with a relative rainfall. The major tribes of the town are: Gude, Fali, Fulani, Margi, Higgi and Mundang as minority. (Adebayo and Dayya,2004).

Ethical Consideration

Due to the sensitivity of the tests that were employed, the consent of chief Medical Director of Ante Natal Care in Lokuwa Maternity Clinic, Mubi was obtained before the commencement of sample collection after obtaining a letter of introduction from the Department of Zoology informing the Health Centre of objectives and benefits of the study. The consent of the participants was equally obtained in the languages they understand, pre, post and result counseling was given to all participants.

Study Population and Sampling

The study included 100 pregnant women at different trimesters. The inclusion criteria was between the ages of 17-40 years. The sample was collected by attending the Ante-Natal Care Clinic on alternate days of the two working days of the clinic/week throughout the study period. The recruited pregnant women were asked to make a regular follow-up monthly and whenever they need any medical care until de1ivery. The minimum required number for urine analysis, of each woman was three (either once/trimester or three/pregnancy) as they are at different trimesters. A serial sampling method was used as ten (10) pregnant women were recruited daily until the sample size was obtained. A standardized questionnaire was administered to each patient to obtain socio-demographic information

Urine Collection

A sterilized bottle was given to each pregnant woman and instruction on how to collect the samples were given as described by Karlowsky *et al.* (2016). Urine samples were labeled and transported immediately to clinic pathology laboratory of ante Natal Care in Lokuwa Maternity Clinic, Mubi. Urinalysis using urine dipstick was done following manufacturer's instructions. With a calibrated wire loop, urine was streaked on blood agar and incubated at 37°C for 24 hours and was observed for any bacterial growth.

Urinalysis and Culture

A 5µl and 10 µl plates was used to inoculate urine samples on MacConkey agar plates. Plates were incubated for 24hr at 37°C. A diagnosis of UTI was expected when at least 105 colony forming unit (CFU)/ml of urine. A high colony count with more than one species of bacteria was considered as contaminations. For contaminated specimens, culture was repeated. Identification was performed using in-house biochemical testing. Disc diffusion method was used to determine susceptibility of the isolates. Individual colonies were suspended in normal saline to 0.5 McFarland. For quality control, of the culture, *E. coli* ATCC 25922 was used as control strains. Media and materials that were used were sterilized by autoclaving at 121 lb g^{-1} for 15mins.

Data Analysis

Data collected was analyzed using SPSS version 21.00. The Chi-square-test was used to compare between data and establish any statistical difference. Univariate analysis was used to determine the association. Probability values of < 0.05 were considered as statistically significant.

Result

Of the 100 pregnant women examined, 48 (48.0%) were positive for Urinary Tract Infection (UTI).

Table 1 shows the prevalence of Urinary Tract Infection (UTI) among pregnant women based on age group. Age group 17-21 had the highest prevalence of 55.0% followed by age group 22-26 (50.0%) and 27-31 (45.5%) respectively. The least prevalence was recorded among the age group 27-31 (45.5%) and no (0.00%) infection was recorded in the age group ≥ 37. Chi-square analysis revealed that there was no significance difference in infection based on age group (P>0.05). Gram negative bacteria occurred more frequently than Gram positive bacteria. The commonest bacterium which was detected in culture was *Escherichia coli* (45.8%). This was followed by *Klebsilla spp* (37.5 %) and *Staphylococcus aureus* (16.7%)(Table 2) There was high rate of infection in the third trimester (78.46.00%), compared to first trimester (9.23%), and second trimester (12.31%) (Table 3).

Table 1: Prevalence of Urinary Tract Infection (UTI) based on age group

Age Group	Number Examined	Number Positive (%)
17-21	20	11 (55.0%)
22-26	36	18 (50.0%)
27-31	33	15 (45.5%)
32-36	9	4 (44.4%)
≥37	2	0 (0.0%)
Total	100	48 (48.0%)

$x^2 = 2.428$, df=4, P=0.658

Table 2: Bacterial isolate from 100 positive urine cultures in pregnant women

Bacterial isolates	Species	Percentage (%)
Gram Negative	Staphlococcus aureus	16.7%
	Escherichia coli	45.8%
	Klebsiella spp	37.5%

Table 3: Prevalence of UTI based on trimester

Trimester	Percentage
1st trimester	9.23%
2nd trimester	12.31%
3rd trimester	78.46%

Discussion

The result of this study revealed higher prevalence (48.0%) of Urinary Tract Infection (UTI) when compared with the study by Nicolle, (2010) who reported 32% as the highest prevalence rates of UTI among pregnant women. Ahmad *et al*. (2013) reported 39.19% prevalence rate of UTI as the highest amongst pregnant women in Makkah, KSA. However, the result of this study revealed a wide range of UTI distribution among the populace.

The study again revealed that age group 17-21 years had the highest (55.00%) distribution of Urinary Tract Infection (UTI) (55.0%). This agrees with the work of Sheik *et al. (2010)* who reported the same age group (17-21 years) among younger nursing girls to be more prevalent (49%) to UTI. The result contradicts the work of Al-Kadassy *et al.* (2016) who reported that pregnant women between ages 20-29 recorded the highest infection rate of 73.33% and in another study conducted by Lele *et al* .(2016) 75.8% was reported among pregnant women above 30 years of age. The findings of this study is also in disagreement with that of Amiri *et al.* (2015) who recorded the highest UTI among pregnant women above 30 years of age of 15.86%. This suggests that younger pregnant women in this study might be ignorant of Urinary Tract Infection and might be the first time of being pregnant .More so, younger pregnant women are always shy in disclosing their feelings and symptoms of Urinary Tract Infection during ante natal care to the nurses. In this study, women in their 3rd and 2nd trimester were found to have the higher incidence of UTI 78.46 % and 12.31 % respectively. This could be due to the anatomical and physiological changes that occur during that stage. This finding is in agreement with the report of Anozie *et al.*, (2016) who recorded the highest UTI among pregnant women in their 2nd and 3rd trimester (70.3% and 24.3% respectively) in Tertiary Health Institution in Abakaliki South East Nigeria. However, the findings of this study is in disagreement with that of Al-Kadassy *et al.* (2016) who recorded the highest UTI among Hodeidah city pregnant women in their 2nd and first trimester. The reason of this difference could be due to geographical location and ignorance of being pregnant in the first trimester in our study subjects. The most implicating organisms causing urinary tract infections among these pregnant women in this study were Escherichia coli and were responsible for 45.8% of the cases of UTI. This was followed by Klebsiella spp. (37.6 %),) and S. aureus (16.7%). This finding is similar to other reports which suggest that Gram negative bacteria, particularly E. coli is the commonest pathogen isolated in patients with UTI also reported that E. coli was the most commonly isolated pathogen in significant bacteriuria

Conclusion and Recommendations

Urinary Tract Infection is still a problem to females despite the fact that several researches have been conducted and came up with recommendations with the hope of overcoming this problem. However, the results of the present study showed a prevalence of 48.0% among female participants aged 17-37 years at Lokuwa Maternity Clinic Mubi, Adamawa State. From this result, it can be concluded that the knowledge, awareness, prevention and control of Urinary Tract Infection is insufficient among the participants.

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