

**THE PREVALENCE OF BACTERIAL URINARY TRACT INFECTIONS (UTI)
AMONG WOMEN ATTENDING ANTENATAL CLINIC IN THE GENERAL
HOSPITAL, MINNA IN NIGER STATE**

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ABSTRACT

Background: Bacterial Urinary tract infection is common in pregnancy and may lead to complications such as preterm labor and premature rupture of membrane if untreated.

Aim: This study investigates the prevalence of urinary tract infection (UTI) among women attending antenatal clinic in the general hospital, Minna.

Materials and Methods: A total of 100 urine samples were collected and analyzed for the presence of bacteria.

Results: Of the total number of samples investigated, 75 (75.0%) were found to be positive for bacterial UTI. The distribution of infection on the basis of age revealed prevalence rates of 100.0%, 94.4% and 64.0% for age groups 30-39, 20-29 and 40-49 respectively. The prevalence rates for the groups were found to be significantly high ($P > 0.05$). One hundred and ten bacterial agents were isolated, characterized and identified. *Klebsiella* spp showed the highest frequency of occurrence of 43 (39.1%) and followed in descending order by *Escherichia coli*, *Staphylococcus aureus*, *Proetus vulgaris*, *Pseudomonas aeruginosa* and *Salmonella* spp with 31 (28.2%), 23 (20.9%), 11(10.0%) 1 (0.9%) and 1 (0.9%) respectively.

Conclusion: The study revealed a high prevalence of bacterial UTI in the study area for all the age groups investigated. The result underscores the need for the implementation of a control program in the area.

Keywords: Prevalence, Bacterial, Infections, Urinary

1. INTRODUCTION

Hormonal and mechanical changes associated with pregnancy increase the risk of urinary stasis and vesico-ureteral reflux which in conjunction with an already short urethra and difficulty with hygiene due to a distended belly increase the frequency of urinary tract infection in pregnant women¹

Urinary tract infection (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 per milliliter with accompanying pyuria (>7 WBCs per ml) in a symptomatic patient. Two clinical entities are recognized in patients with symptomatic UTI: the lower UTI (cystitis) and upper UTI (pyelonephritis). In general, pregnant patients are considered immuno-compromised UTI hosts because of the physiologic changes associated with pregnancy, increasing the risk of serious infectious complications from symptomatic and asymptomatic urinary infection in a healthy pregnant woman¹

The presence of asymptomatic bacteriuria in pregnancy and the subsequent risk of developing symptomatic urinary tract infection have also been established².

Asymptomatic bacteriuria is defined as the presence of more than 100,000 organisms per milliliter in two consecutive urine samples in the absence of declared symptoms. The relationship of bacteriuria to obstetric complications other than symptomatic urinary tract infection and long term renal complications of bacteriuria in pregnancy have also been evaluated extensively. Infections, particularly in pregnancy and in the elderly, can be asymptomatic but symptomatic bacteriuria is associated with an increased risk of intrauterine growth retardation and low birth weight³.

The risk factors for asymptomatic bacteriuria in pregnant women include increasing age, low socio-economic status, sexual activity, multiparity and untreated pathologies¹. The preponderance of these risk factors in a very high number of pregnant women in Nigeria in general and Minna in particular necessitated

this research study hence the choice of General Hospital Minna which is mostly patronized by people of low income level because of the low service charges. The aim of this study was to determine the prevalence rate of urinary tract infections among women attending antenatal clinic in Minna and to isolate and identify bacterial agent associated with urinary tract infections among the subjects.

2. MATERIALS AND METHOD

2.1 Study Population: The study population included women attending antenatal clinic in the General Hospital Minna. A total of 100 subjects were recruited for the study. Informed consent was obtained from subjects, hospital authorities and clinicians involved in the management of subjects. Only women who were pregnant during the period of this study irrespective of their age were involved. Non-pregnant women attending the hospital were excluded.

2.2 Sample Collection: A total of 100 mid-stream urine samples were collected from the subjects in sterile universal bottles and the ages of subjects were also recorded.

2.3 Sample Processing: The urine samples were delivered to the laboratory immediately following collection where they were screened for the presence of bacterial agents according to the standard procedures⁴ for the diagnosis of bacterial UTI. This included macroscopy, microscopy, gram's stain and biochemical testing. Samples were cultured on Nutrient Agar Plates and incubated aerobically for 24 hrs at 37°C. Individual colonies of bacterial isolates were sub-cultured in fresh Nutrient Agar Plates to obtain pure isolates. The resultant colonies were identified and characterized using appropriate biochemical tests.

3. RESULT

A total of 100 urine samples were examined for the presence of bacterial urinary tract infections in pregnant women between ages 10 to 50 years attending antenatal clinic in the General Hospital Minna. Of the total number of samples investigated, 75 (75.0%) were found to be positive for bacterial urinary tract infections. The distribution of infection on the basis of age revealed prevalence rates of 100.0%, 94.4% and 68.0% for age groups, 40-49, 20-29 and 30-39 respectively (Table 1). The prevalence rates for the groups were found to be significantly high ($P > 0.05$).

In all 110, bacterial agents were isolated, characterized and identified. Out of these 110 isolates, *Klebsiella spp* showed the highest frequency of occurrence of 43 (39.1%) and followed in descending order by *Escherichia coli*, *Staphylococcus aureus*, *Proetus mirabilis*, *Pseudomonas aeruginosa* and *Salmonella spp* with 31 (28.2%), 23 (20.9%), 11 (10.0%), 1 (0.9%) and 1 (0.9%) respectively (Table 2).

4. DISCUSSION

Out of the 100 urine samples analyzed in this study 75% of the samples were found to be positive for bacterial urinary tract infections. This finding is lower than the 86.6% earlier reported⁵ for pregnant women in Benin City, Nigeria, but higher than the 54.0% and 58.0% prevalence rates earlier reported by^{6, 7} among pregnant women in South Eastern Nigeria and South Western Nigeria respectively. The probable reason for this high prevalence rate may be due to the hormonal and mechanical changes associated with pregnancy and a difficulty with hygiene due to a distended belly as earlier explained¹. The low socio-economic status of the subjects as observed in an earlier study⁸ which plays an important role in susceptibility to diseases and access to health care services may also be responsible for the high prevalence rate recorded.

This study also revealed a high prevalence rate of UTI among the age groups (30-39) 68.0%, (20-29) 94.4% and (40-49) 100.0%. This finding corroborates results of previous studies which identified these age groups especially (20-29) and (30-39) as being highly prone to UTI^{9, 6}. It is believed that the high sexual activities among members of these age groups are a factor that promote their predisposition to UTI. The high prevalence among the (40-49) age group may not be unconnected with the few numbers of samples collected and the role of age in increasing prevalence in men and women.

In this study, the bacterial agents isolated in a decreasing order of frequency include *Klebsiella spp* (39.1%) *Escherichia coli* (28.2%), *Staphylococcus aureus* (20.9%), *Proetus mirabilis* (10.0%), *Pseudomonas aeruginosa* (0.9%) and *Salmonella spp* (0.9%). This finding agrees with the reports of earlier studies which identified gram negative bacterial agents as the most offending pathogens in UTI^{7, 10}.

Our finding in this study revealed that *Klebsiella spp* (39.1%) occurred more

frequently than *Escherichia coli* and the other bacterial agents implicated. This result is consistent with the earlier finding of ¹¹ (2001) who had earlier reported the predominance of *Klebsiella spp.* The result is however contrary to the result of earlier findings^{10 6} which reported the predominance of *Escherichia coli* above *Klebsiella spp.*

This present study and the previous ones are however consistent on the involvement of both pathogens in UTI. Fecal continuation as a result of the proximity of the vagina to the anus may account for their involvement in UTI. This possibility is further buttressed by the presence of other enterobacterial pathogens such as *Proetus mirabilis* and *Salmonella spp.*

CONCLUSION

The 75.0% prevalence rate of UTI among pregnant women recorded in this study which is consistent with the greater than 50.0% recorded in many parts of Nigeria highlights the menace of UTI in pregnancy as a serious public health challenge in Nigeria. In addition, this study indicates the possible role of poor hygienic practices in the promotion of UTI in pregnancy. Screening of women for UTI should therefore be adopted as a standard practice during antenatal clinic visitations in Nigeria. Health education especially on the need for improved personal hygiene should be encouraged among pregnant women. All these are necessary in view of the far reaching consequences of UTI in pregnancy both to the mother and the unborn baby.

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Table 1. Distribution of infection on the basis of age group.

Age Group	Number of Subject Screened	Number of Subjects Infected	% Infection
20-29	18	17	94.4
30-39	75	51	68.0
40-49	7	7	100.0
Total	100	75	75

Table 2. Frequency of occurrence of bacterial isolates.

Bacteria	Number of Isolates	% Frequency
<i>Klebsiella spp</i>	43	39.1
<i>Escherichia coli</i>	31	28.2
<i>Staphylococcus aureus</i>	23	20.9
<i>Proetus mirabilis</i>	11	10.0
<i>Pseudomonas aeruginosa</i>	01	0.9
<i>Salmonella spp</i>	01	0.9
Total	110	100