Prevalence of urinary tract infections in pregnant women in Onitsha, Nigeria

Abstract

The prevalence of urinary tract infections (UTIs) in pregnant women in Onitsha was investigated. A total of 200 urine samples were collected from pregnant women attending antenatal care at Kanayo specialist hospital and General hospital both in Onitsha for a period of five months. The urine samples were cultured and examined microscopically. Out of the 200 urine samples analyzed, potentially pathogenic microorganisms were isolated from 112(56%). The pathogenic organisms isolated include Eschericia coli, Staphylococcus aureus, Klebsiella aerogenes, Pseudomonas aerogenes and Proteus mirabilis. Eschericia coli were isolated from 52(26%) of the 200 urine samples, Staphylococcus aureus 20(10%), Klebsiella aerogenes 16(8%) Pseudomonas aerogenes 10(5%) and Proteus mirabilis 14(7%). The organisms were isolated more from the age group of 26-30 years and the frequency was more among the first pregnancy. Pregnant women need to be screened for UTIs to avoid complications during child delivery.

Keywords: urinary tract infections, pregnant women, kanayo specialist hospital, onitsha

Introduction

Urinary tract infections (UTIs) are caused by the presence and growth of microorganism in the urinary tracts, and are perhaps the single commonest bacterial infections of mankind.1 The urinary tracts consist of the organs that collect and stores urine and release it from the body which include kidneys, bladder and urethra.2 Urinary tract infection is characterized by bacterial invasion and multiplication involving the kidneys and urinary tract pathways. UTI has become the most common hospital acquired infection, accounting for as many as 35% of nosocomical infections, and it is the second most common cause of bacteraemia in hospitalized patients.3 Pregnant women are more susceptible than men due to anatomy of short urethra and easy contamination of urinary tract with fecal flora.4 Other main factors which make females more prone to UTI are pregnancy and sexual activities. In pregnancy the physiological increase in plasma volume and decrease in urine concentration lead to the development of glycosuria in women which in the end lead to bacterial growth in the urine.5 Three common clinical manifestation of UTI in pregnancy are: asymptomatic bacteriuria, acute cystitis and acute pyelonephritis.6 Other symptoms include nausea, vomiting, frequent urination, dysuria, premature birth and low birth weight.7 The common etiologic agents of UTI include Escherichia coli, Klebsiella spp, Staphylococcus aureus, Pseudomonas spp and Streptococcus.8 This research work was done to determine the prevalence of urinary tract infection among pregnant women in Onitsha.

Methods

Study site: The study was carried out at Kanayo specialist hospital and General hospital both in Onitsha, Anambra state, Nigeria.

Sample size: 200 urine samples of pregnant women coming for antenatal care at Kanayo specialist hospital and General hospital between the ages of 20-35 were collected.

Demographic information: Socio-demographic data such as age, occupation, parity and gestational age were collected from the pregnant women using standard questionnaires.

Sample collection: 200 clean-catch midstream urine was collected from each pregnant woman into a sterilized screw capped container and labeled properly.

Sample processing: Ten-fold serial dilutions were made by transferring 1ml of the sample in 9ml of sterile physiological saline. 1ml was then poured into molten nutrient agar in petri dishes and rotated for homogenization. The contents were allowed to set and the plates were incubated at 37°C for 24 hours. A loopful of each urine samples was inoculated on Cysteine-Lactose Deficient (CLED) agar and blood agar and incubated at 37°C for 24 hours.

Identification of isolates Bacterial species were identified according to standard bacteriological methods as highlighted by Cheesbrough M.9

Results

A total of 200 midstream urine samples were collected from pregnant women. Table 1 shows that Escherichia coli had the highest percentage of occurrence 52(26%), Staphylococcus 20(10%), Klebsiella aerogenes 16(8%), Pseudomonas aerogenes 10(5%) and Proteus mirabilis 14(7%). Table 2 shows the prevalence of urinary tract infection in relation to age within the age group of 20-35 years. The highest prevalence of UTI is seen in the age group of 26-30 years and the lowest prevalence is seen in the age group of 20-25 years old. Table 3 shows the prevalence of UTI in relation to gravidity. The highest prevalence of UTI is seen in primi gravidity while the lowest prevalence rate is seen in multi gravidity.

Table 1 Percentage Occurrence and Distributions of Bacterial Pathogens in UTIs among Pregnant Women

| Micro-organism isolated | Percentage of Occurrence (%) |
|-------------------------|------------------------------|
| Escherichia coli         | 52 (26%)                     |
| Staphylococcus aureus    | 20 (10%)                     |
| Klebsiella aerogenes     | 16 (8%)                      |
| Pseudomonas aerogenes    | 10 (5%)                      |
| Proteus mirabilis        | 14 (7%)                      |
| Total                    | 112 (56%)                    |
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Table 2 Prevalence of Urinary Tract Infection in relation to Age of Pregnant Women

| Age (years) | No tested | No positive | Prevalence (%) |
|-------------|-----------|-------------|----------------|
| 20-25       | 60        | 25          | 22             |
| 26-30       | 75        | 54          | 48             |
| 31-36       | 65        | 33          | 30             |
| Total       | 200       | 112         | 100            |

Table 3 Prevalence of Urinary Tract Infection in relation to Gravity

| Gravida       | No examined | No positive | Prevalence (%) |
|---------------|-------------|-------------|----------------|
| PrimiGravida  | 62          | 50          | 45             |
| SecondGravida | 73          | 40          | 35             |
| MuluGravida   | 65          | 22          | 20             |
| Total         | 200         | 112         | 100            |

Discussion

The prevalence of urinary tract infections (UTIs) among pregnant women receiving antenatal care at Kanayo specialist hospital and General hospital both in Onitsha was considered to be high. Out of 200 urine samples of the pregnant women, 112(56%) showed growth of pathogenic bacteria which is similar to the findings but contradicts the findings. In our study the highest prevalence of UTI is seen in primigravidity (45%) and the lowest prevalence of UTI is seen in multigravidity (20%) which contradicts the findings of that have the highest prevalence of UTI among the multigravidas as a result of pressure effect of a bigger uterus on the ureter and pressure on the bladder from the descending part leading to stasis of urine and the increased multiplication of urine. This study shows that pregnant women within the age of 26-30 years had more infections than women within the age of 20-25 years and it may be as a result of sexually activity which increases the risk of UTI and the women of such age group are mostly sexually active. This report is also similar to that who also found that prevalence of UTI increases in sexually active women within the same age group. This study shows that the most common bacteria isolated from the mid stream urine samples of pregnant women was Escherichia coli which is similar to the separate findings.

Conclusion

The prevalence of urinary tract infections during pregnancy is very high (56%). All pregnant women should be screened for UTI with a urine culture. Early diagnosis and treatment of UTI during pregnancy can ensure the safety of the mother and the foetus. It also prevents complications during child delivery.

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Conflict of interest

There is no conflict of interest among the authors.

References

1. Theodor M. Prevalence and antibiogram of urinary tract infections among prison inmates in Nigeria. The Internet Journal of Microbiology. 2007;3(2):12–23.
2. Anon. Urinary tract infection in women. 2006.
3. Stamm WE. Scientific and clinical challenges in the management of urinary tract infections. Am J Med. 2002;113: Suppl 1A:1S–4S.
4. Kawser P, Afroza M, Azrunath AB, Monowara B. Prevalence of urinary tract infection during pregnancy. J Dhaka National Med Coll Hosp. 2011;7(02):8–12.
5. Weinstein MP, Towns ML, Quarrey SM, et al. The clinical significance of blood cultures in the 1990s: A prospective comprehensive evaluation of the Microbiology, epidemiology and outcome of bacteremia and fungemia in adults. Clin Infect Dis. 1997;24(4):584–602.
6. Loh KY, Silvalingam N. Urinary tract infections in pregnancy. Malays Fam Physician. 2007;2(2):54–57.
7. Mc Gregor JA, French JJ, Ritcher R, et al. Antenatal Microbiological & Material risk factors associated with prematurity. Am J Obstet Gynecol. 1990;163(5 pt 1):1465–1473.
8. Ronaldo A. The etiology of urinary tract infections: traditional and emerging pathogens. Dis Mon. 2003;49(2):71–82.
9. Cheesbrough M. Medical laboratories manual for tropical countries. 2002;2:479.
10. Idakwo SO, Masaw JD, Abalaka ME. Prevalence and antibiogram of urinary tract infections in patients attending hospitals in Minna, Niger State. Int J Journal of Microbiology, Biochemistry and Molecular Biology. P. 8–12.
11. Nileka SL, Sagar KB. Clinicobacteriological study of urinary tract infections in pregnant women. IOSR Journal of Dental and Medical Sciences. 2015;14(11 ver. IV):43–49.
12. Lawani EU, Alade T, Oyelaran D. Urinary tract infections (UTIs) among pregnant women in Amassoma, southern Nigeria. African Journal of Microbiology Research. 2015;9(6): 355–359.
13. Kawser P, Afroza M, Arzunath AB, et al. Prevalence of urinary tract infection during pregnancy. J Dhaka National Med Coll Hosp. 2011;7(02):8–12.
14. Daniyan SY, Abalaka ME. Frequency and susceptibility profile of pathogens associated with urinary tract infection. American Journal of Traditional Medicine & Pharmaceutical Sciences. 2013;(1):1–7.
15. Omer EI, Fadil E. Principles of medical microbiology. University Students Library, Makkah AL Mukarramah, Saudi Arabia.1986:9-26.