

## Prevalence and Antimicrobial Sensitivity of Urinary Tract Infection among Pregnant Woman in Khartoum Stat

Nazar Abdalazeem Osman<sup>1</sup>, Amal Mohammed Osman<sup>2</sup>, Habeeb Allah Abdullah<sup>2</sup>

<sup>1</sup>Departments of Medical Microbiology, Faculty of Medicine, Sebha University, Sebha, Libya

<sup>2</sup>West Nile College, Department of medical laboratory, Khartoum, Sudan

Email: [nazar585@hotmail.com](mailto:nazar585@hotmail.com)

**Abstract: Introduction:** Urinary tract infection (UTI) is one of the most common infections and it account for about 1 – 2% of all consultation. Urinary tract infections (UTIs) are one of the most common medical complications of pregnancy; it has been reported among 20% of the pregnant women. **Objective:** This study was conducted to detect the frequency of UTIs in pregnant women, isolate and identify the bacterial causative agents, determine the effective treatment and to study the validity of pyuria as indication to UTIs. **Methods:** Descriptive cross-sectional study, fifty pregnant women randomly selected was admitted into the study. All samples were inoculated into cystine lactose electrolyte deficiency (CLED) and incubated aerobically. Microscopic examination was done to detect the presence of pus cells, red blood cells, epithelial cells, yeast cells, crystals, casts, ova or other materials. **Results:** Out of Fifty pregnant women, the frequency of significant bacteruria of urine culture was 30% and significant Pyuria was 42.7%, the rate of the infection with UTIs was higher in women with the first trimester. The commonest organism isolated was *Escherichia coli* accounting for (50%) followed by *Klebsiella. Pneumonia* (20%), *Staph. Saprophyticus* (10%), *Staph. aureus* (8%) and *Proteus. Mirabilis*, *Pseudomonas aeruginosa* isolated with equal rate of (6%). Most isolates were sensitive to Meropenem 66.7% and Chloramphenicol (63.6%). **Conclusion:** frequency of significant bacteruria of urine culture and significant Pyuria were (30%) and (42.7%) respectively, the commonest organism isolated was *E.coli*. Most isolates were sensitive to Meropenem and Chloramphenicol. [Nazar Abdalazeem Osman, Amal Mohammed Osman, Habeeb Allah Abdullah. **Prevalence and Antimicrobial Sensitivity of Urinary Tract Infection among Pregnant Woman in Khartoum Stat.** *Nat Sci* 2014;12(11):55-58]. (ISSN: 1545-0740). <http://www.sciencepub.net/nature>. 9

**Keywords:** Prevalence, Antimicrobial Sensitivity, Urinary Tract Infection, Pregnant Woman ,Khartoum Stat

### 1. Introduction

Urinary tract infections (UTIs) are one of the most common medical complications of pregnancy, and it has been reported among 20% of the pregnant women. Physiologic changes of pregnancy increase a woman's susceptibility to UTI. Progesterone effects and mechanical compression by the gravid uterus impair emptying of the bladder and lead to increased bladder residual volume and vesicoureteral reflux. <sup>(1)</sup>

UTI represent a wide variety of conditions, including asymptomatic forms of UTIs, Urethritis, cystitis, acute pyelonephritis and pyelonephritis with bacteremia or sepsis. <sup>(2)</sup>

UTIs infectious agents have the potential to invade the tissues of the urinary tract and adjacent structures. The infection may be limited to the growth of bacteria in the urine (asymptomatic) or it can result in several syndromes associated with an inflammatory response to the bacterial invasion.

Complications of Untreated UTI include poor maternal and perinatal outcomes <sup>(3)</sup>, Furthermore, cystitis and pyelonephritis <sup>(4)</sup> can lead to acute respiratory distress, transient renal failure, sepsis and shock during pregnancy. <sup>(5)</sup> Screening of pregnant women for UTI can minimize these UTI associated complications. <sup>(6)</sup>

Initial antimicrobial treatment is empiric. Intravenous antimicrobial therapy, including regimens of ampicillin, plus gentamicin, cefazolin, and ceftriaxone, are equally efficacious <sup>(7, 8)</sup>. With appropriate antimicrobial management, 75% of patients become asymptomatic and afebrile within 48 hours, whereas 95% will defervesce within 72 hours of treatment. <sup>(9, 10)</sup>

Development of resistance to these antimicrobial agents in UTI cases will therefore affect future treatment and management of the infection with these drugs. Adequate treatment and control of these conditions need a good knowledge of the bacteria species involved and their susceptibility to antimicrobial agents. <sup>(11)</sup>

The organisms that cause UTI during pregnancy are the same as those found in non-pregnant patients. *Escherichia coli* accounts for 80%–90% of infections. <sup>(12)</sup>

Scholes et al. reported on 231 patients and showed that *E. coli* was the causative uropathogen for 85% of infections. Other causative organisms were *Staphylococcus saprophyticus*, *Klebsiella* spp., *Enterobacter* spp. and *Proteus mirabilis*. <sup>(13)</sup>

## 2. Material and Method

Fifty pregnant suffering from UTI were admitted into the study during the period of Jun to August 2011 from different hospitals in Khartoum state. The study type is descriptive using cross-sectional design in which the disease was occurred and the frequency was determined.

Fifty samples of clean catch mid stream urine were collected from pregnant patients in sterile, screw capped, leak proof disposable plastic container. Each specimen was inoculated on cystine lactose electrolyte deficiency (CLED) medium by using sterile standard loop of 0.001 micro litres in diameter, all cultures were aerobically incubated at 37°C for 24 hours.

On a clean dry slide, 2 to 3 drops of urine were placed and covered with cover glass. The slide was then examined microscopically using the low and high power field to detect the presence of pus cells, red blood cells, epithelial cells, yeast cells, crystals, casts, ova or other materials.<sup>(14)</sup>

Presence of 10<sup>5</sup> cfu/ ml or more colony forming units of bacteria per millilitre of urine (100 or more colonies on the media) was regarded as significant bacteruria. The count of less than 10<sup>5</sup> cfu/ ml consider as insignificant result.

Colonies were identify by gram stain and biochemical test, disc diffusion technique was used to test antimicrobial sensitivity, isolated colonies were taken by sterile loop and emulsified in 3-4 ml of sterile physiological saline, the turbidity of suspension was compared to the barium chloride turbidity stander.

Sterile swab was soaked in the test organism suspension and swab was streaked over the surface of the Muller Hinton agar. The Petri-dish allowed 3-5 minutes to dry, by using sterile forceps the antimicrobial disc were placed evenly distribution on the inoculated plate, then incubate the plate aerobically at 37°C for 24 hours.

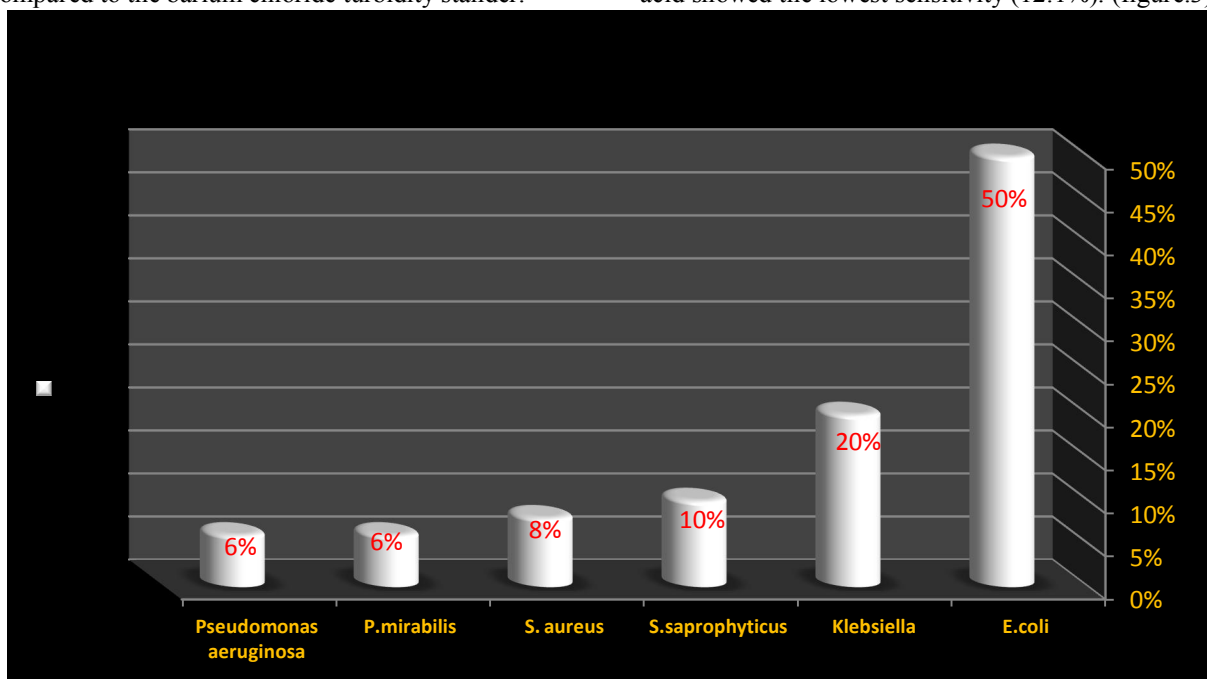
The antimicrobial used include: Gentamicin (10mcg), Nitrofurantoin (100mcg), Amikacin (30mcg), Meropenem (10mcg), Nalidixic Acid (30mcg), Cefoxitin (30mcg), Ampicillin (10mcg), Chloramphenicol (30mcg), and Norfloxacin (10mcg).

## 3. Result

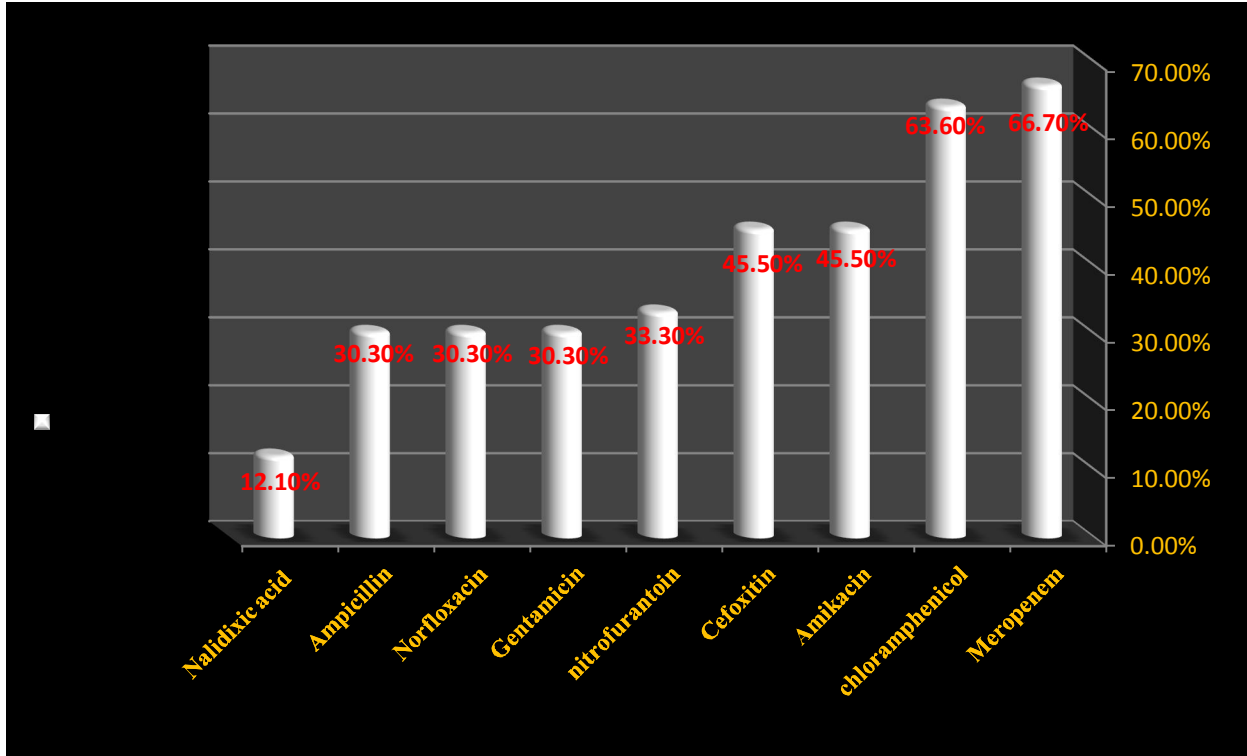
Frequency of UTIs among pregnant woman patients was 30%, *E.coli* was the commonest organism isolated from pregnant woman accounting for 50% of all significant growths, followed by *K. Pneumonia* 20%, *S .saprophyticus* 10%, *S. aureus* 8%, *P. mirabilis* and *P. aeruginosa* accounting for an equal rate of 6%. (figure.1)

The findings of this study showed that 59% of the women who had UTIs were in their first trimester, 21% in the second trimester and 20% to the last trimester in their 1st pregnancy. (figure.2)

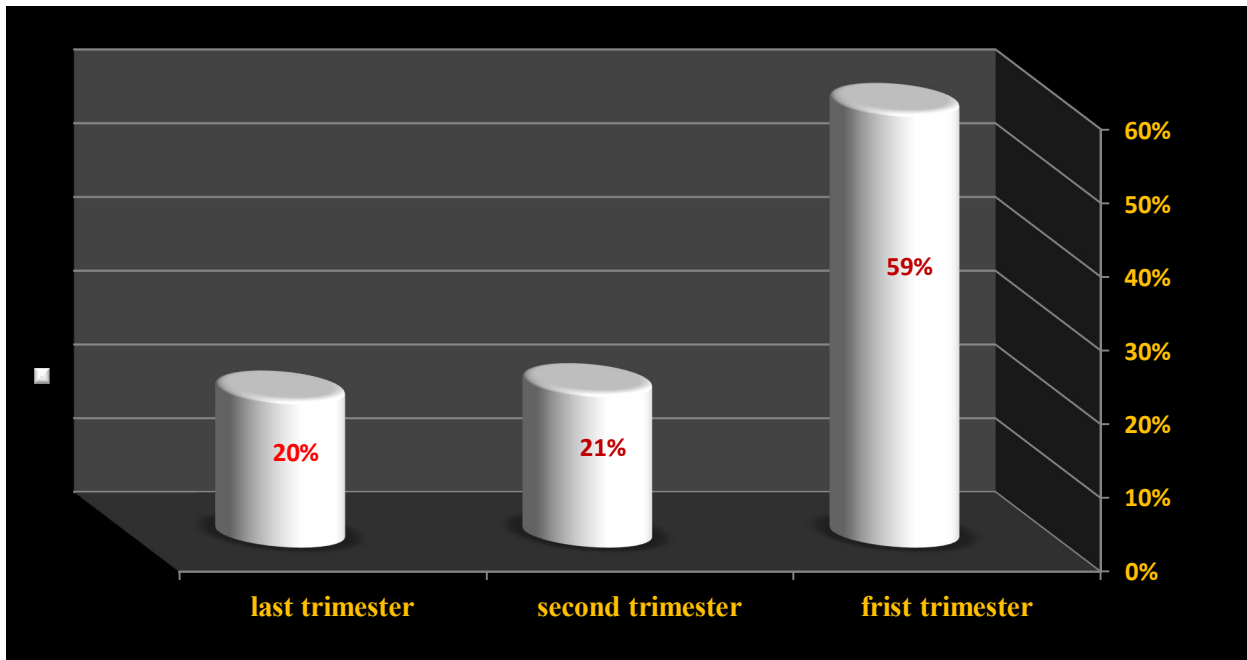
Meropenem and chloramphenicol were best tested antibiotics with sensitivity of 66.7% and 63.6% respectively, Followed by Amikacin and Cefoxitin (45.5% each), nitrofurantoin (33.3%). Gentamicin, Norfloxacin and Ampicillin (30.3% each) but Nalidixic acid showed the lowest sensitivity (12.1%). (figure.3)



(figure.1) Showing types and percentages of different isolates causing UTIs among pregnant women



(figure.2) Showing Pattern of antibiotic sensitivity of total isolates Causing UTIs in study group



(figure.3) Showing relation between gestation time and isolated bacteria

**4. Discussion**

The most implicating organisms causing urinary tract infections among these pregnant women in this study were *Escherichia coli* and were responsible for 50% of the cases of UTI. This was followed by

*Klebcella* (20%), *S. saprophyticus* in 10%, *S. aureus* in 8%, *P.mirabilis* and *Pseudomonas aeruginosa* accounting for an equal rate of 6%.

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, Ebie and his colleagues and Njoku and his colleagues.<sup>(15,16)</sup> Other two Nigerian studies<sup>(17,18)</sup> also reported that *E. coli* was the most commonly isolated pathogen in significant bacteriuria.

However, the findings in this study comparably was similar to the 29.8% incidence rate of UTI reported by August SL and De Rosa MJ in panama<sup>(19)</sup>, but higher than a prevalence rate of 14.0% by Hamdan and his colleagues in Sudanese pregnant women.<sup>(20)</sup> This high prevalence and incidence of UTI reported in this study may be attributed to the lack of proper personal and environmental hygiene in our patients.

Although the spectrum of agents causing UTI in pregnant woman is relatively constant, their antibiotic susceptibility patterns are different in different geographical locations, Nalidixic acid in the present study was no longer found to be effective for UTI as 87.9% of our isolated showed high degree of resistance to it. Previously this antibiotic was used as the drug of choice for empirical treatment of UTI. Meropenem and chloramphenicol the two common drugs used as drug of choice for in the treatment of UTI among our isolated.

## 5. Conclusion:

Frequency of significant bacteriuria of urine culture and significant Pyuria were 30%, 42.7% respectively, the commonest organism isolated was *E.coli*. Most isolates were sensitive to Meropenem and Chloramphenicol. Urine culture for screening and diagnosis purpose for first trimester pregnant is recommended.

## Corresponding Author:

Nazar abdalazeem osman

Faculty of Medicine, Sebha University, Sebha, Libya,

Email: [nazar585@hotmail.com](mailto:nazar585@hotmail.com)

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