URINARY TRACT INFECTIONS IN SYMPTOMATIC PREGNANT WOMEN ATTENDING UNIVERSITY OF ABUJA TEACHING HOSPITAL, GWAGWALADA, NIGERIA.

***DR. YUNUSA, THAIRU** MBBS, FMCPath
**Department Of Microbiology And Parasitology,*
University Of Abuja/ University of Abuja Teaching Hospital Gwagwalada, Abuja
Federal Capital Territory, Nigeria.
Email- Samhaamal200@gmail.com

****DR. KOLADE-YUNUSA, HADIJAT OLUSEYI** MBBS,FMCRad
Consultant Radiologist,
***Department of Radiology,*
University of Abuja Teaching Hospital
Gwagwalada, Abuja
Email- SEYTOT@YAHOO.COM

Correspondence:
DR. YUNUSA, THAIRU
Department Of Medical Microbiology And Parasitology,
University Of Abuja/university Of Abuja Teaching Hospital
P.M.B. 228, Gwagwalada, Abuja
Federal Capital Territory
Nigeria
+2348023768868
Email- SAMHAAMAL200@GMAIL.

ABSTRACT

Background: Several notable human pathogens cause urinary tract infections. Several factors are known to predispose an individual to developing urinary tract infections; one of the factors is pregnancy. Therefore, this research set out to determine the bacteriologic profile of urinary tract infection and the susceptibility pattern among symptomatic pregnant women in Abuja.

Methodology: This was a descriptive cross-sectional study. One hundred and eighty consecutive symptomatic pregnant women who attend antenatal clinic and those with symptoms such as loin pain, fever, dysuria, urgency and urinary frequency were recruited and were well informed to collect clean catch midstream urine aseptically.

Results: Urine samples of 180 symptomatic pregnant women were examined for bacteria pathogens, of this 78 pregnant subject had significant bacteria and positive culture with a positive culture rate of 43.3%. The overall prevalence of UTI in Gwagwalada was 2.6%. The mean age of symptomatic pregnant women was 29.2±3.2. The mean gestational age and mean parity age was the total study population was 26.6±4.1 and 2.7±1.4 years respectively. Predominant symptoms were fever and urinary frequency with 23.8% and 22.2% respectively. Gram negative bacteria (coliforms) were wholly responsible for fever while Gram positive bacteria were agents for urinary frequency. Overall *E. coli* and *Staphylococcus saprophyticus* were the predominant bacteria isolated (23.0% and 15.4%). Augumentin and levofloxacin had the best antibiogram profile against most of the isolates.

Conclusion: The outcome of this study clearly shows *E. coli* as the leading cause of symptomatic UTIs and augumentin as the most sensitive antibiotics.

INTRODUCTION

Aim of Study:

Urinary tract infections (UTIs) are common in pregnant women. By convention, UTI is defined either as a lower tract (acute cystitis) or upper tract (acute pyelonephritis) infection[1] and the term asymptomatic bacteriuria refers to the presence of a positive urine culture in an asymptomatic person While symptomatic bacteriuria refers to positive urine culture in the presence of urinary symptoms.[1,2]

The physiological changes associated with

pregnancy such as the relaxation of the ureter and the mechanical effect of the enlarging uterus which compresses on the ureter as pregnancy advances result in urinary stasis.[3,4] As the gravid uterus enlarges, it presses on the bladder and prevents complete voiding; the stagnant urine is a source of infection.

There are several anatomical reasons for the increased frequency of urinary tract infection in women as compared to men. The female urethra is relatively short (approximately 2.8-3.5cm in length) [5] and is in close proximity to the vaginal canal which in is close to the anus and rectum. The vagina is richly colonized with organisms from the lower gastrointestinal tract such as *Escherichia coli, Klebsiella-pneumoniae* and *Proteus species*, which are common pathogens isolated from women with Urinary tract infections.[6] Urethral trauma secondary to intercourse may also play a role in the colonization of the lower urinary tract and acute cystitis has been reported to be associated with sexual intercourse.[6] It has been demonstrated that certain uropathogens have the unique ability to invade and attach themselves to the uroepithelium of the lower urinary tract, the P-fimbriated strain of *Escherichia coli* is able to attach to specific receptor in the uroepithelium.[6] This may explain why urinary tract infection is more common in women and why some women are more susceptible to persistent or recurrent bacteriuria and the acquisition of upper tract infection such as acute pyelonephritis.[5,6,7]

Bacteriuria often develops in the first month of pregnancy and is frequently associated with a reduction in concentrating ability, suggesting involvement of the kidneys.[8] The smooth muscle relaxation and subsequent ureteral dilatation that accompany pregnancy are thought to facilitate the ascent of bacteria from the bladder to the kidney. As a result, bacteriuria during pregnancy has a greater propensity to progress to pyelonephritis.[9.]

Urinary tract infection was documented by Abdelmalak and colleaques as the most common bacterial infections in the elderly but also the most common and frequent acute bacterial infection in pregnancy and second to parasitic plasmodiasis as the cause of fever in pregnancy.[10] These infections have been noticed to be more common in sexually active women as sexual intercourse seem to trigger an infection[10]. In the Cleveland clinic stated that when all women considered, the incidence of urinary tract infection increases at a rate of 1% to 2% per decade.[1,7,10]

For pregnant women, urinary tract infection is the most common infectious complication, resulting in five times as many febrile episodes as viral infections. Studies have shown 2%-11% of pregnant women to have asymptomatic bacteriuria in early pregnant.[11] It is a stated fact that bacteriuria in pregnancy carries a much greater risk of progressing to acute pyelonphritis, than in non-pregnant women (28% vs. 40%). Statistics have shown that 13% to 27% of pregnant women will experience such a progression and that the incidence of acute pyelonephritis in women without bacteriuria is only 0.4%.[11,12]

An untreated urinary tract infection can result to the introduction of bacteria into the blood stream, a condition known as urosepsis, this can lead to dissemination of the bacteria to several susceptible organs in the body including the placenta and threaten the survival of the foetus and the mother with antecedent maternofetal mortality.[13]

Bacterial isolate implicated as causative agent of UTIs in pregnancy includes: *Escherichia coli, Klebsiella species, Enterobacter species, Enterococcus, Staphylococcus, Proteus, Pseudomonas and Citrobacter Species*. The Enterobacteriaceae account for 80 to 90% of urinary infections during pregnancy.[13,14,15,16.]

Routine screening of pregnant women for UTIs has been associated with a decrease in associated complications such screening kits are inexpensive and readily available but plague with drawbacks of varying degree of sensitivity and predictive value, these tests are good for determination of asymptomatic bacteriuria but for symptomatic bacteriuria, culture method is the gold standard. The burden of UTIs is very much underestimated and the choice of antibiotics usually a difficult task taking into consideration effect of antibiotics on pregnancy.

Ciprofloxacin and levofloxacin are quinolone with good susceptibility profile against most of the urinary tract bacteria, although, they are capable of causing arthropathy in children.[17,18,19] Urinary tract bacteria are generally sensitive to gentamicin, nitrofurantoin, and pefloxacin. Urinary tract infections are well known cause of antibacterial resistance in our environment, resistance such as β-

lactamases and extended spectrum β-lactamases were well documented among enterobacteriaceae.[16,20,21]

Aim of the study

The aim was to determine the bacteriologic profile of urinary tract infection and the susceptibility pattern among symptomatic pregnant women in a tertiary health institution in Gwagwalada, Abuja.

MATERIALS AND METHODS

Study background

This study was carried out at the Microbiology research laboratory unit, Microbiology and Parasitology department, University of Abuja Teaching Hospital (UATH) Gwagwalada, Federal Capital Territory (F.C.T). The Hospital is located in Gwagwalada whose geographical coordinates are 8° 56' 29" North and 7° 5' 31" East. It has an area of 1,043 km². The Federal Capital Territory had a projected population of 1,406,239 inhabitants in the year 2006, of which 157770 (11.22% approximately) inhabitants reside in Gwagwalada.[22] Projected population of Gwagwalada city in 2012 was over 1 million people. The hospital provides health care services to the inhabitants of Abuja and neighbouring states including Niger, Kaduna, Kogi and Nassarawa states. The Hospital has an average of 3,000 deliveries annually, and annual attendees at the booking antenatal clinic well over 3,000.

Study population

Consecutive pregnant women who presented in the hospital either through the Gynaecologic Emergency Unit and the Antenatal Clinic (ANC) who presents with signs and symptoms of urinary tract infections such as dsyuria, urinary frequency, fever and loin pain and consented to participate in the study were enrolled and were informed about the need for this work using the study tools (questionnaire and consent form).

INCLUSION CRITERIA:

i. All pregnant women.
ii. All pregnant women between the ages 15year to 45 years.
iii. All women including booked and those that did not booked in the hospital.

EXCLUSION CRITERIA

i. Patient that discontents to be part of the study.
ii. Pregnant women less than fourteen years.
iii. Nonpregnant women.
iv. Menopausal women.
v. All pregnant women who are diagnosed of parasitic plasmodiasis.

Study design

This was a descriptive cross – sectional prospective study conducted from July 2013 to August 2014.

METHODS

Diagnosis was achieved in collaboration with the Obstetrician. Pregnant women diagnosed of urinary tract infections were recruited. The purpose of this study was explained to the subjects before their consent to participate was sought. The consent form was filled by the investigator and the subjects recruited signed the form. Interviewer-administered, structured questionnaires were used as the study tool. The questions outlined in the data forms were explained to the subjects and completed forms which contain information that included the bio-demographic data (such as subject age, gravid age, parity, educational status), provisional diagnosis and laboratory processes, such that the eventual result was noted in the data forms and communicated to the Obstetrician and the patients. The data obtained was coded on entering and analyzed using Epi Info version 3.5.1 package. Confidence interval was 95% and the p value was 0.05.

SPECIMEN COLLECTION, TRANSPORTATION AND PROCESSING

All the subjects were given plastic universal sterile transparent container with screw cap and were enlightened to clean the genital area three times with lukewarm water and allowed to air dry, avoiding chemicals. In addition, the cleaning should be anterior to posterior in unidirectional with the labial majora and minora held apart. Clean catch midstream urine was collected and submitted to the microbiology and immunology research laboratory where macroscopy, microscopy, cultural characterization and antibiogram were performed.

The type and quality of specimens submitted to the laboratory usually determine the success of isolating the bacteria. Each specimen received should therefore be examined for quality, in terms of amount, sterility and presence or absence of debris.[24]

The urine specimen was macroscopically examined for turbidity, presence of blood and divided into two

equal parts. Urine obtained from the first part (uncentrifuge urine) was used for urinalysis and Gram's stain procedure while urine from the second container were aseptically centrifuged at 3000 rpm for 5 minutes, with the supernatant discarded and the residue used in inoculating blood agar and Cysteine Lactose Electrolyte Deficient (CLED) and the remaining residue was microscopically examined, presence of pus cells was noted. Calibrated wire loop with internal diameter of 5mm that delivers 0.002ml was used to inoculate the samples on those media. The cultures were incubated at 37°C for 18-24 hours with adequate moisture. Positive nitrite on urinalysis and presence of pus cells were considered features suggestive of urinary tract infection but the presence of at least one Gram organism per oil-immersion field in uncentrifuged urine or colony count of greater than 10^5/ul of urine from overnight growth on blood agar plate was considered significant bacteruria. After overnight incubation on the CLED, the growth characteristics were noted and pure growth was Gram stained.[24,25] Colonies that were Gram positive were further characterized using the catalase, coagulase and novobiocin disc tests. Those with Gram negative were further characterized using the API^R 20 (Oxoid, 211667 Hampshire, UK). Gram negative identification and iMMVPC test (indole, motility, methyl red, voges-proskeuer and citrate).[25]

Antibiotics susceptibility pattern was determined using the Muller-Hinton media by the disk diffusion method. Materials used were; Muller-Hinton media, Petri dish, Antibiotics disks (oxoid, Hamsphire, UK), Mac falance standard, sterile swab stick, control strains (*Staphylococcus aureus* ATCC 29213, *Escherichia coli* ATCC 25922, *Pseudomonas aeruginosa* ATCC 27853, *Enterococcus faecalis* ATCC 29212).[24]

Three well-isolated colonies of similar appearance from the isolates and the controls were emulsify in separate 4ml of sterile physiological saline each, labelled, test and controls. The turbidity of the suspensions (both test and controls) was compare to 0.5 Mac falance standards. Muller-Hinton media for both the test and the control were streaked with test suspension and control suspension respectively using sterile swab. After 5mins, sterile forceps was used to place the antibiotics disc, evenly distributed on both plates (similar antibiotics were tested in both the test and the controls). Within 30 minutes of applying the discs, the plates were incubated at 35°C for 18 to 24 hours. After overnight incubation, the test and the control plates were examined. Using a ruler on the underside of the plates the diameter of each zone were measured in mm.

Interpretation; The zone diameter of each antibiotics of control were compared with the CLSI standards, if within the CLSI acceptable limits for Quality control strains, then the zone diameter of each antibiotics of the test were compared with CLSI zone diameter breakpoints and was recorded sensitive, intermediate or resistance.[24,26]

RESULTS

This study was carried out among 180 symptomatic pregnant women between the ages of fifteen years and forty-five years and none withdrew after consenting to the study. The mean age of symptomatic pregnant women was 29.2±3.2 with the highest proportion within the age range of 26-30 years accounting for 31.7% of the pregnant women enrolled and the lowest proportion being 41-45 years group accounting for 5.0%. Twenty-seven women representing 15.0% were within the 15-20 years age group, 36 and 28 were from the 21-25 and 36-40 years age group representing 20.0% and 15.6% respectively. However, this distribution was not statistically significant (P >0.05, Table 1). The mean gestational age and mean parity age of the total study population was 26.6±4.1 and 2.7±1.4 years respectively. Out of the 180 of symptomatic pregnant women whose urine were examined for bacteria pathogens, 78 symptomatic pregnant subjects had significant bacteria and positive cultures with a positive culture rate of 43.3%. The overall prevalence of UTI in Gwagwalada was 2.6%. Of the 78 isolates obtained from 78 culture positive, 14 were isolated from the 15- 20 years age group giving a prevalence of 51.9%, 22 (61.0%) from the 21-25 years age group; 20 (35.0%) from the 26-30 years age group, 11 (47.8) from the 31-35 years age group and six and five from the 36-40 years and 41-45 years age groups, giving a prevalence of 21.4% and 55.5% respectively. This was statistically significant (p=0.001).

From the 180 symptomatic pregnant women, 84 pregnant women were primigravida while 96 were multigravida representing 46.7% and 53.3% respectively. 40 isolates out of the total 78 isolates

obtained in this study were from primigravida symptomatic pregnant women while the remaining 38 isolates were obtained from multigravida symptomatic pregnant women representing isolation rate of 47.6% and 39.6% respectively. This was not statistically significant (p=0.09, Table 2).

Among the 180 pregnant women studied, 36 (20.0%) and 43 (23.8%) pregnant women presented with dysuria and fever, while 31 (17.2%) and 40 (22.2%) pregnant women presented with symptoms of loin pain and urinary frequency. Urinary urgency presentation contributed 16.8% of the total symptoms at presentation. (Table 3). 28 culture positive were obtained from symptomatic pregnant women with symptoms of fever with prevalence of 65.1%, *E. coli* was the predominant bacteria isolated among those patients with fever (42.9%) and all the isolates were Gram negative bacteria stastically significant (p=0.001, spearman's correlation=0.238). Those with symptom of urinary frequency yielded 10 isolates with 25.0% isolation rate, although *S. aureus* (40.0%) was mostly isolated and all the isolates were Gram positive, this was stastically significant (p=0.001; spearman correlation=0.163). *S. saprophyticus* was predominantly isolated from pregnant women who presented with loin pain and urgency (42.9% and 60.0%) but the distribution were not statistically significant (p=0.301 and p= 0.08). The kidneys of 37 symptomatic pregnant women were echogenic, 31 of the subjects kidneys showed poor corticomedullary differeciation (CMD) while the remaining 112 symptomatic pregnant subjects showed normal kidneys on ultrasound. The ultrasound findings in these patients were not stastically significant (p=0.08).

Seventy seven pregnant women who presented with symptom were in the 3rd trimester representing 44.2% isolation rate but the highest isolation rate was obtained among first trimester symptomatic pregnant women (48.0%) while culture negative urine was obtained from pregnant women in the second trimester. The relationship between the isolation rate and their trimester was stastically significant (p=0.001, Table 4). The occupation of the subjects enrolled were Civil servant, Business women, Teachers, Housewives and applicants with frequencies of 35 (19.4%), 30 (16.6%), 20 (11.2%), 65 (36.1%) and 30 (16.7%) with isolation rate of 28.6% (10), 43.3% (13), 85.0% (17), 35.4% (23), and 50.0% (15) respectively.

Seventy-eight urine samples had significant bacteriuria of single isolate with positive nitrite test, significant bacteriuria and characterization of pure colonies with API system. The following organism were isolated; *Klebsiella pneumoniae (K. pneumoniae), Escherichia coli (E.coli), Pseudomonas aeroginosa (P. aeroginosa), Proteus mirabilis (P. mirabilis), Enterobacter cloacae (E. cloacae)* (Gram negative bacteria). *Staphylococcus aureus (S. aureus), Streptococcus agalactiae (S. agalactiae), Enterococcus faecalis (E. faecalis), Staphylococcus saprophyticus (S. saprophyticus)* (Gram Positive bacteria). Among the organism isolated, *Escherichia coli* (23.0%) was the most predominant bacteria recovered. *S. aureus, S. saprohyticus, E. cloacae, K. pneumoniae* and *P. mirabilis* isolation rate were 10.6%, 6.4%, 11.5%, 11.5% and 10.2% respectively (Table 5). The rate of susceptibility to levofloxacin, augumentin, ceftriaxone, gentamicin, meronem and co-trimaxazole among *E. coli* isolate were 100.0%, 92.0%, 95.5%, 68.4%, 100.0% and 47.5% respectively (Table 6).

Table 1: Distribution of bacteria isolation among age group in Gwagwalada.

Age group (years)	Total	Percent Culture (%)	Positive	Percent (%)
15 – 20	27	15.0	14	51.9
21 – 25	36	20.0	22	61.1
26 – 30	57	31.7	20	35.0
31- 35	23	12.8	11	47.8
36 – 40	28	15.6	6	21.4
41 – 45	9	5.0	5	55.5
Total	**180**	**100.0**	**78**	
$\chi 2 = 3.21$	df = 5	P = 0.001		

Table 2: Gravidity and Urinary Tract Infection (UTI) among pregnant women in Gwagwalada.

Gravidity	Total	Percent (%)	Isolates	Percent (%)
Primigravida	84	46.7	40	47.6
Multigravida	96	53.3	38	39.6
Total	**180**	**100.0**	**78**	**43.2**
$\chi 2 = 4.32$	df = 1	P = 0.09		

Table 3: Relationship between symptoms of UTI and bacteria isolate among pregnant women

Symptoms	Positive Culture	Percent (%)	Bacteria isolates (n, %)	Total (%)	P-value
Dysuria	21	58.3		36 (20.0)	
			E. coli (6, 28.6)		
			E. cloacae (1, 4.8)		P=0.001
			S. aureus (4, 19.0)		Spearman
			P. mirabilis (4, 19.0)		Correlation
			K. pneumoniae (2, 9.5)		=-0.301
			S. agalactiae (1, 9.8)		
			E. faecalis (3, 14.2)		
Loin Pain	14	45.2		31 (17.2)	
			S. saprophyticus(6, 42.9)		
			S. agalactaie (2, 14.3)		P= 0.301
			P. aeroginosa (2, 14.3)		Spearman
			E. cloacae (3, 21.4)		Correlation
			E. faecalis (1, 7.1)		=0.921
Fever	28	65.1		43 (23.8)	
			E. coli (12, 42.9)		
			K. pneumoniae (7, 25.0)		P=0.001
			E. cloacae (5, 17.9)		Spearman
			P. aeroginosa (2, 7.1)		Correlation
			P. mirabilis (2, 7.1)		=0.238
Urgency	5	16.7		30 (16.8)	
			S. saprophyticus (3, 60.0)		P=0.08
			P. mirabilis (2, 40.0)		Spearman
					Correlation
					=-1.001
Nocturnal Frequency	10	25.0		40 (22.2)	
			S. aureus (4, 40.0)		P=0.001
			S.saprophyticus (3, 30.0)		Spearman
			S. agalactaie (2, 20.0)		Correlation
			E. faecalis (1, 10.0)		=0.16

Table 4: Gestational age and isolation of bacteria among pregnant women wi th UTI in Gwagwalada.

Gestational age	Isolation rate (Percent)	Culture Negative (Percent)	Total (Percent)
1st Trimester	24 (48.0)	26 (52.0)	50 (27.8)
2nd Trimester	20 (37.7)	33 (62.3)	53 (29.4)
3rd Trimester	34 (44.2)	43 (55.8)	77 (42.8)
Total	**78**	**102**	**180 (100.0)**
$\chi 2$ =	df = 2	P = 0.001	

Table 5: Bacteria Isolates among pregnant women in Gwagwalada.

Bacteria Isolates	Total	Percent (%)
Klebsiella pneumoniae (K. pneumoniae)	9	11.5
Enterococcus faecalis (E. faecalis)	5	6.4
Escherichia coli (E. coli)	18	23.0
Staphylococcus aureus (S. aureus)	8	10.6
Enterobacter cloacae (E. cloacae)	9	11.5
Pseudomonas aeroginosa (*P. aeroginosa*)	4	5.0
Streptococcus agalactiae (*S. agalactiae*)	5	6.4
Proteus mirabilis (*P. mirabilis*)	8	10.2
Staphylococcus saprophyticus (S. sapropyticus)	12	15.4
Total	**78**	**100.0**

Table 6: Antibiotics susceptibility pattern of the isolates from pregnant women in Gwagwalada.

Bacteria	NIF	AMP	AUG	LEV	CRO	MER	GEN	COT
K. pneumoniae n=9	100.0	50.0	90.0	100.0	66.8	100.0	50.8	78.8
E. coli n =18	80.0	40.0	92.0	100.0	95.5	100.0	68.8	47.5
E. cloacae n=9	50.0	30.0	80.5	96.8	30.0	70.6	97.6	58.7
P. aeroginosa n =4	32.3	44.0	76.5	50.0	20.5	50.0	12.7	0.0
P. mirabilis n =8	46.5	50.0	86.4	53.0	44.6	86.5	46.3	10.0
S. saprophyticus n =12	45.0	96.0	100.0	76.6	66.0	98.0	40.0	33.0
S. aureus n =8	58.5	100.0	100.0	100.0	96.8	100.0	56.0	41.0
E. faecalis n= 5	57.3	88.0	100.0	92.0	98.8	100.0	55.0	32.0
S. agalactiae n=5	46.9	78.5	100.0	50.0	60.6	92.8	32.6	10.8

Discussion

The prevalence of urinary tract infection among symptomatic pregnant women was 43.3%. This figure varies with findings in Nigeria[19], Africa[15] and other parts of the world. The finding of 43.3% prevalence of UTIs in this study was higher than findings of 31.6% in Kano, northwestern Nigeria[19], and 14.6% Mwanza, northwestern, Tanzania[15]. These differences may be due to the methodology employed in our study and the literacy level of the women for antenatal care. The study took place in federal capital territory of Nigeria where most of the patients are literate and were able to follow instructions about quality specimen collection, transportation and submission. The study in Kano had a larger sample size investigated both asymptomatic and symptomatic pregnant women. The Nwanza study collected midstream urine on the day of enrolment and analyzed within an hour but the isolate were identified using in-house biochemical testing.

The outcome in this study was lower than prevalence rate 46.5% obtained in Abakaliki, Ebonyi, South-east Nigeria by Onoh and colleagues[17] where the subject were only pregnant women with laboratory confirmed UTI and determine the social class of the subjects.

The age distribution of the subjects with the highest age proportion between 26-30 years (31.7%) was statistically significant (P=0.000), but this was consistent with findings in Kano[19], Abeokuta[16] and Abakaliki[17]. In the study by Onoh and colleaques[17], the subjects were predominantly within the age range of 20-29 years but lower mean age. This is however a good picture and improvement in healthy living which is a deviation from the past where teenage pregnancy were rampant. Isolation rate of bacteria were predominantly obtained from primigravida subject (47.6%) although there were higher enrolment of multigravid subjects, this was stastically significant. This was consistent with the study in Abakaliki[17] but contrary to report by Masinde and colleaques[15]. Primigravid are first time pregnant and inexperience about symoptoms of UTIs and are more likely to present late to the clinic and more chances of significant bacteriuria and culture positive.

Urinary tract pathogens were frequently isolated from urine of pregnant women with symptom of fever (65.1%) and Gram negative bacteria were completely responsible for fever. The distribution was stastically significant (p=0.001) and correlate positively with significant bacteriuria and culture positive (spearman correlation=0.238). This was consistent with other findings.[17,19,21,23] Gram negative bacteria have potent lipid A which has the capacity to induce endotoxic sepsis and consequently increased interleukin and tumour necrotic factor. Ascending Gram positive bacteria were predominantly the cause loin pain, urgency and urinary frequency. Diagnosis of UTIs in pregnant women with fever is usually difficult in the tropics, this is due to the fact that other parasitic infectious agents can also cause fever such as plasmodiasis in pregnancy, in this study malaria was ruled out. Advance pregnancy may cause increase urinary frequency, but substantial number of isolates were obtained from patients with frequency. Also, this study revealed the significant of bacteriologic examination of urine in the diagnosis of UTIs rather than radiologic scan. In communities with low socioeconomic status, multiple of investigations may not be desirable; therefore bacteriologic examination will not only indicate the presence of bacteria and detect the bacteria but also outline the possible appropriate antibiotics.

E. coli was the most frequently isolated among patient enrolled with 23.0% of the total isolates. This was consistent with other finding[16,,17,18,19,20] where *E. coli* has the highest isolation rate. But unlike other studies[14,15,16,17] where *staphylococcus aureus* ranked next to *E. coli*, *Staphylococcus saprophyticus* was the next frequently isolated (12 isolates, 15.4%). Overall, Gram negative bacteria were predominantly isolated more than the Gram positive bacteria such as *Enterococcus feacalis, S. aureus, Streptococcus agalactiae and S. saprophyticus* (61.2% vs 38.8%) which was consistent with Ezeome and colleaques[14] but contrary to other studies[15,16,17,19] Although the differences observed may not be due to the characteristic differences in their cell wall, but may probably be related to individual bacterial colonization and quantum of colonization. This supports the fact that urinary tract infections were derived from organisms that colonizes the lower gastrointestinal tract and lower genital tract (labia majora and labia minora). Gram negative and Gram positive isolates were sensitive to levofloxacin, augumentin, meronem, ceftriaxone and gentamicin. This is consistent with other studies[16,17,18] where most of the isolates were sensitive to quinolones. *E. coli* has significant resistance to commonly use antibiotics such as ampicillin (60.0%), gentamicin (31.2%), cotrimaxazole (52.5%), and augumentin (8.0%). *P. aeroginosa* and *P. mirabilis* was resistant to gentamicin (12.7% and 46.3%), levofloxacin (50.0% and 47.0%), augumentin (23.5% and 13.6%). Indiscrimate use of antibiotics, irrational administration of antibiotics and use of antibiotics for poultry survival and poor administration of drugs may be responsible for this increasing antibiotic resistance. Due to the problems associated with the quinolones use in pregnancy, augumentin was recommended.

Conclusion

The outcome of this study can be used in the prediction, determination and treatment of urinary tract infections in symptomatic patients. UTIs in pregnancy may be difficult to treat because of the effect of antibiotics on the mother and fetus, but early presentation and determination of significant bacteriuria from noninvasive midstream urine can

make a big difference.

Conflict of interest
There is no conflict of interest

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