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Isolation and Diagnosis of Bacteria Causing Urinary Tract Infection in Pregnant and Non Pregnant Females with Diabetes Mellitus Type2

Faraj Hato Joni Al-Bidhani*
Techanical Medical Institute, Baghdad, IRAQ
*Correspondent author email: faraj63@gmail.com

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Abstract

Diabetic patients have more outcomes of urinary tract infection than non diabetes, mortality of urinary tract infection (UTI) is 5 times higher in patients with diabetes old age, the incidence of urinary tract infection in pregnant women is slightly higher than non pregnant women, urinary tract infection in pregnant women either as a symptomatic bacteriiuria or symptomatic infection, which is more complication during pregnancy this present study was done in March 2016 to July 2016, the patients were females, total samples of 80 patient of pregnant and non pregnant with diabetes mellitus, selected from medical and general surgical wards, the samples were sending to teaching laboratories from the same hospital, the present study show that the incidence of UTI at non pregnant diabetic women occur at age (9-11) years (45%), the most common causative agents of UTI in diabetic pregnant females is *Escherichia coli* 20(50%), the results of microscopical examination of urine of pregnant with diabetes mellitus of urine of pregnant with diabetes mellitus revealed that (43), pyuria and (28) had crystals, and the result of microscopical examination of urine of non pregnant females with diabetes mellitus revealed that the common causative agent is *Escherichia coli* 3(30%), (9) had pyuria and (4) had crystals.

Keywords: urinary tract infection, diabetes mellitus, pyuria, bacterial, risk factors.

الخلاصة

مرضى السكر أكثر اصابة بألتهاب المجاري البولية من المرضى غير المصابين بمرض السكر ، وكذلك النساء الحوامل اكثر اصابة بألتهاب المجاري البولية من النساء الغير حوامل ، يحصل التهاب المجاري البولية في مرضى السكر بعمر ٩ الى ١١ سنة ، وأكثر البكتيريا المسببة لالتهاب المجاري البولية عند النساء الحوامل المصابات بمرض السكر هي بكتيريا اشيريشيا كولايين.

Introduction

Urinary tract infection UTI, it means the present of bacteria which are multiplication in urine with in urinary drainage system, the urinary tract infection in diabetic women occurs due to sweat urine which is serves as media to growth of bacteria[1]. The high incidence of urinary tract infection with diabetic patients can causes rapid parenchymal involvement, pyelonephritis was found more incidence in premeno paused diabetic women more than non diabetic, diabetic women are more liable to UTI due to decreased of neutrophil response and decrease of cytokines in urine and decreased of leukocyte concentration[2]. Patients frequently suffer from bacterial (cystitis) with higher prevalence in diabetic women including higher prevalence of both a symptomatic bacteriuria and symptomatic UTI added to recurrent complications as compared to healthy women, explanation of the increased UTI in diabetic patients might be the nerve damage caused by high blood glucose level, decreased urine and thus allowing urine to stay for along time in the bladder and increasing infection probability[3]. E. coli is the most frequent bacterium in UTI, other aggressive pathogen are highly prevalent

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in diabetic UTIs are gram positive microorganism as staphylococcus aureus[4]. Many factors which are increased risk of urinary tract infection in diabetics which include age, duration of diabetes mellitus metabolic control[5]. There are many types of urinary tract infection in pregnancy as a symptomatic bacteriuria, acute cystitis and pyelonephritis and the clinical features of these conditions vary[6]. People with type 2 diabetes mellitus are enhanced risk of infection with urinary tract, being the important site of infection[7]. Pregnancy is the most factor to enhanced of urinary tract infection in the 6th week of pregnancy, because of physiological changes in the ureters which is become latge and continues at 22-26 weeks and until of delivery[8]. The typical features of pyelonephritis in the pregnant women and non pregnant are similar, many cases of pyelonephritis occur at the second and third trimesters, the women with pyelonephritis characterized with pyuria[8][9]. E coli is the most causative agent in recurrent urinary tract infection, which its responsible for 80% of cases in diabetic patients without urologic abnormality or calculi[9][10]. Diabetic women have four times more urinary tract infection in the treatment orally or insulin injection, those patients suffer from a symptomatic bacteriuria and symptomatic urinary tract infection and recurrent complication compared with healthy women, increased of UTI in diabetic patients due to high glucose levels in urine which is increased the growth of bacteria[10][11]. Bacteriuria was defined as urine culture plates appear that ≥ 105 colony- forming units (cfu) / ml of single bacterial species, the symptomatic bacteriuria is bacteriuria and symptoms of urinary tract infection but the a symptomatic bacteriuria is symptoms of bacteriuria without urinary tract infection[11][12].

Pyelonephritis, cystitis, perinephric abscess and renalabscess more common in diabetes mellitus, women with pyelonephritis may develop some complication such as kidney injury, aremia, hypertension and septic shock[12][13]. The a symptoms bacteriuria in women which is increases with age of women also associated with abnormalities in the urinary tract, and higher in women with longer duration of diabetes and glycemic status[14].

Aim: to determine the causative organisms susceptibility of urinary tract infection in diabetic patients.

Material & methods

Consecutive female patients with type II DM were approached to participate in the study, regardless the presence or absence of urinary tract infection, exclusion criteria included patient age, gender and asked about symptoms suggestive of urinary tract infection and history of medical disorders. All the samples were collected within 5 months from 20-45 years old patients of females with diabetic, the samples were collected by using sterile urine containers which were opened in the sampling process to prevent any contaminations, the samples were transported to the laboratory in order to culture on suitable media for 24 hours under a septic techniques and stored at 4c, then samples were cultured on the nutrient agar. The pure colony that resulted from the first inoculation was cultured into 4 plates of mcconkey agar, manitol salt agar, eosin methylene blue and blood agar, then incubated aerobically at 37 °C and observed after 24 and 48 hour. The pure colonies isolated were examined under dissecting microscope to detect the shapes. The positive specimen was considered for urinary tract infection, if a single organism was cultured at concentration of ≥ 105 colony forming unit / ml. 10ml of each urine samples were centrifuged at 3000 revolution per minutes for 5 min. wet preparations and Gram stained smears of deposits were examined micro-scopically for the presence of pus cell, red blood cells, crystals epithelials cell, parasites, yeasts, yeasts and bacterial cells. bacterial cells, bacteria organism were isolated and identified according to standard bacteriological procedure as national committee for clinical laboratory standards (NCCLS).

Result

Total samples of 80 patients with diabetic females 40(50%) and non diabetic females 40

(50%), the prevalence of UTI in diabetic females occur at age 26-35 years (47%) and low prevalence occur at age 36-45 years (15%) as in Table 1. the present study show that the prevalence of UTI in non diabetic females occur at age 9-11 years (45%) as in Table 2. the result of urine microscopy from diabetic females revealed that 43 had pyuria 22, had numerous RBC, 27 had epithelial cell, 28 had crystals, It was observed that E-coli is responsible for large proportion of UTI in diabetic women, accounting for 20 (50%) of the isolate , followed by klebsiella aspecies 15(12.5%), protens mirabilis 8(20%), streptococcus 4(10%), staphyloccus a ureus 3(7.5%), Table 3, the prevalence of organism relationship to microscopical examination of urine in non diabetic females showed that (9) had pyuria, (3) had numerus of RBC, (9) had epithelial cells, the most frequent is *Escherichia coli* 3(30%) followed by klebsiella 2(20%), proteus 2(20%), streptococcus 1(10%) staphylococcus 1(10%) as in Table 4.

Discussion

Diabetic women have higher risk of UTI more than non diabetic (Harding, et al, 2002),[15] in the present study showed that bacteruria (43%), much higher rate than that found in non diabetic females (9%), this is disagreement with study carried out in Lagos University Teaching hospital, a prevalence rate of 21.7% (Odyebo et al, 2001)[16]. The most pathogensis isolated from urine of diabetic patient with UTI are Escherichia accounting for 20(50%) as in table 1, is the same as in the usual population of patient with the UTI (Abu-Bakare and oxyaide, 1986)[17]. Styphyllo coccus aereus the lowest causes of UTI in diabetic 3(7.5%) as in table 3, in the table 4, showed *Escherichia coli* the common cause of UTI in non diabetic women 3(30%) similar to study done by Zamanzad, 2006,[18] (20%), in the present study the staphyllo coccus the lowest cause of UTI in non diabetic females 1(10%), high prevalence of UTI in diabetic females occurs in age 26-35 years (47.5%) but the lowest occur at age 36-45 years (15%) as in Table 2 showed the prevalence of UTI in non diabetic females occurs at age 9-11 years (45%) but the lowest is 12-15 years (5%) Similar to some authors (puri N, et al, 2006)[19] were found the prevalence of urinary tract infection in non diabetic patients occurs over 20 years of old age.

Table 1: Prevalence of organization in urine samples with diabetes in relation to their age.

Age group	No.	%
20- 25	15	37.5%
26 – 35	19	47.5%
36 – 45	6	15%
	40	100%

Table 2: Prevalence of organization in urine samples of no diabetic females in relation to their age.

Age group	No.	%
6 – 8	20	50
9 – 11	18	45
12 - 15	2	5
	40	100

Table 3: Number and types of bacteria isolates from pregnant females with diabetic and relationship by microscopical examination of urine.

Types of bacteria	No.	%	Pus cell	R.B.C.	Epithelal cell	Crystals	No. of bacteria on field
Escherichiacoli	20	50	18	11	17	16	14
Proteus mirabilis	8	20	7	6	2	4	5
Klebsiella	15	12.5	6	3	5	4	3
Strepto coccus spp	4	10	5	1	2	2	4
Staphyllo coous aurens	3	7.5	7	1	1	2	6
Psendo monas aeraginosa	-	-	-	-	-	-	-
	40	100	43	22	27	28	32

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Table 4: Number and types of bacteria isolates from non pregnant females with diabetic and relationship by microscopical examination of urine.

Types of bacteria	No.	%	Pus cell	R.B.C.	Epithelal cell	Crystals	No. of bacteria on field
Escherichiacoli	3	30	3	1	3	2	1
Proteus mirabilis	2	20	2	1	2	2	-
Klebsiella	2	20	2	1	1	-	-
Strepto coccus spp	1	10	-	-	1	-	-
Staphyllo coous aurens	1	10	1	1	1	-	-
Psendo monas aeraginosa	1	10	1	1	1	-	-
	10	100	4	3	9	4	1

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