

Recognition of urinary tract infection pathogens and their association with the age of the infected Iraqi women.

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Abstract

This study aims to isolate pathogens from urinary tract and their association with the age of the infected Iraqi women. The result revealed that the pathogens isolated from urinary tract were identified as: *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa*, *Gardnerella vaginalis*, *Klebsiella oxytoca*, *Proteus mirabilis* and *Candida albicans*. The results of the relationship of urinary tract infection with the age showed that incidence of infection among females age group 19-39 years also fungal infections decreases with age while bacterial infections increases.

Introduction

In the adult female, urinary tract infection is the most common reason for seeking medical advice (1). Most women will experience some form of urinary tract infection at least once in their lives (2). Several hundred million women are affected by urinary tract infection annually (3). Complicated urinary tract infections generally occur in patients with structural and hormonal abnormalities of the urinary tract as well as in the elderly and immunocompromised (4). Asymptomatic bacterial urea is also a common

finding in women, and sometimes it is followed by symptomatic urinary tract infection, these infections are usually caused by a broad spectrum of uropathogens like *Escherichia coli*, *Pseudomonas aeruginosa* and *Proteus mirabilis* (5; 6). This study was designed to isolate and identify urinary pathogenic microorganisms from female patients and to evaluate the relationship of urinary tract infection with the age of the infected female patients.

Methods

Collection of urine samples:

Urine samples were randomly collected from 250 female patients who attended to the obstetric and gynecology clinics in Fatima AL-Zahra hospital in Baghdad and 25 of control samples were collected from healthy women during July 2006 to March 2007. Samples were collected in sterile glasses containers of 50 ml volume by using mid stream specimens method according to (7). Mid stream urine samples were taken which were used for microscopically examination and for culturing.

Urine microscopical examination (GUE):

By using portable centrifuge, 10 ml of urine was centrifuged at 3000 rpm for 5 min, then the supernatant was discarded, one drop of the retained sediment in the centrifuge tube was put on glass slide, and covered by cover slide, then examined under 40 x powers (7).

Urine culture:

Technique for quantitation of organism in urine was done by using full loop inoculation, volume 0.1 ml of human urine was spread on enriched media (blood agar) and selective media (Sabourauds dextrose agar, MacConky agar), the samples were incubated at 37C° for 18-24 hr, after that the number of bacterial colonies on the agar was calculated and the number of organism in 1 ml of urine was measured (8).

Identification of yeasts:

The isolated yeasts were identified as described by (9) via:-

Gram stains:

Small portion of yeast colony was transferred by sterile loop, smeared and fixed on microscopic slide for staining by Gram stain to examine cells shape, grouping and reaction (10).

Production of chlamydospores:

Corn meal agar medium was inoculated with single colony of the isolated yeast. inoculation was done by making 3-6 parallel cuts of 1 cm in length on surface of the media, the streaks were covered by a sterile cover slip the inoculated plates were incubated at 28C° up to 2 days. Examination of plates for the presence of chlamydospores was done under microscope (11).

Production of germ tube:

A small portion of the isolated colony was emulsified in one ml of sterile human serum and then incubated for 2-3 hrs at 37C°, one drop of the suspension was placed on clean slide with drop of lactophenol cotton blue then examined microscopically for the production of germ tube (12).

Biochemical tests:

A- Sugar fermentation test:

A set of sugars consists of glucose, lactose, maltose and sucrose, which were used for identification and differentiation between *Candida* spp., the test was done by inoculating tubes containing fermentation media and 2% sugar with part of the colony, shaking gently then incubated at 28-30C° for 3 days. The positive result was recorded by changing the color of bromocrysol puraple indicator to yellow and production of CO₂ gas bubbles in Durham tube (13).

B- Carbohydrate assimilation test:

The test depends on the ability of different species of yeasts to grow in various sugar solutions (glucose, lactose, trehalos, raffinose and sucrose). Carbohydrate assimilation medium was poured in Petri dishes and inoculated with *Candida* spp., then 6 wells were made by cork borer in the inoculated plates, each well were filled with 2% sugar and incubated plates at 30C° for 2-4 days.

Identification of bacteria:

The isolated bacteria were identified according to (10; 14) by using Gram stain and biochemical tests including: oxidase, indole, catalase, urea hydrolysis, geletinase, kiliglar iron agar, coagulase, phenylalnine deaminase, motility and Whiff test.

Results and discussion

The results of urine samples examination showed that *Escherichia coli* was the main common pathogen 61 (26.29%) followed by *Staphylococcus aureus* 56 (24.13%), *Candida albicans* 48 (20.68%). This percentages were higher when compared to the other percentages of microorganism like *Pseudomonas aeruginosa* 23 (9.91%), *Gardnerella vaginalis* 10 (4.31%), *Klebsiella oxytoca* 7 (3.01%) and *Proteus mirabilis* 6 (2.58%) as shown in table (1) which represents the types of yeasts and all bacteria isolated from patients and control group. These results that had been investigated in the present work agree with many local studies like (15) and (16) who found that *E.coli* was the main pathogen of urinary tract infection followed by other microorganism like *S. aureus*, *P. aeruginosa*, *Klebsiella* and *Proteus*.

Table 1: The percentage of different pathogens from patient's urine samples as compared to control .

Microorganism	NO. of isolates (patient)	%	Control (normal)	%
<i>Escherichia coli</i>	61	26.29	3	15.7
<i>Staphylococcus aureus</i>	56	24.13	3	15.7
<i>Candida albicans</i>	48	20.68	7	36.8
<i>Pseudomonas aeruginosa</i>	23	9.91	4	21
<i>Gardnerella vaginalis</i>	10	4.31	0	0
<i>Klebsiella oxytoca</i>	7	3.01	0	0
<i>Proteus mirabilis.</i>	6	2.58	2	10.5
Mixed infection (bacteria with yeasts)	21	9.05	0	0
Total positive samples	232	100	19	100
Total sample	250		25	

In fact many investigators agreed that *E. coli* was the most common pathogen of urinary tract, originate in the intestine and ascend via the perineum, vagina, and urethra into the bladder (17).

There are two theories that attempted to explain infection of the urinary tract with *E. coli* derived from the intestine. The prevalent theory holds that the numerically dominant fecal strain is most likely to infect the urinary tract (18). The special-pathogenicity theory holds that a special subset of the intestinal microflora is most likely to infect the urinary tract (19). Only a small percentage of infection is caused by bacteria being delivered to the urinary tract via the blood stream (20).

The present study is in agreement with the study of 18 who indicated

that the percentage of isolate were 20% of *E. coli* and 20.5% of *S. aureus*, where as the *P. mirabilis* was recorded as the least 5.2% among isolates and other pathogens range between them. These results agree with observation of many investigators world wide like (21; 22). Furthermore, the researcher (23) recorded that over 85% of UTI cases, are caused by *E. coli*, in addition to 15% *S. aureus* and other bacteria such as *K. oxytoca*, *P. mirabilis* and *P. aeruginosa* are occasionally involved.

The relationship of urinary tract infection with the age was investigated in this study and the patients were grouped into four categories according to their age as shown in table (2). It was clear that percentage of infection with *Candida* was high among females age group (19-39 years), females at this age group were sexually active and therefore, the prevalence of infection is expected to be high because they acquire the infection by contact with infected consorts. In addition, most of the women at this age may be newly married, pregnant or using contraceptive pills that increase the chance of exposure to infection more than other age groups.

These above results are in agreement with that obtained by (24) who reported that the incidence of the disease was increased in women with age group ranging between (18-40 years). It seems that *C. albicans* decreases with age while bacterial infection increases.

Table 2: The relationship of urinary tract infection with the age of infected female patients.

Age range of the patients	Candidal infection	Bacterial infection
19-29	20	29
30-39	14	35

40-49	7	46
50-67	7	53
total	48	163

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التقصي عن المسببات المرضية لالتهابات المجاري البولية وعلاقتها بأعمار النساء العراقيات المصابات

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الخلاصة

هدفت الدراسة إلى التقصي عن المسببات المرضية لالتهابات المجاري البولية وعلاقتها بأعمار النساء العراقيات المصابات وأوضحت النتائج أن المسببات المرضية المسببة لتلك الالتهابات كانت كالآتي:

Staphaphlococcus aureus, Escherichia coli, Psedomonas aeruginosa, Gardnerella vaginils, Klebsilla oxytoca, Proteus mirabilis, Candida albicanis.

وثبت من النتائج إن الإصابات تركزت في الفئة العمرية المحصورة ما بين 19-39 سنة ومع تقدم العمر يتناقص تردد الإصابة بالالتهابات الفطرية بينما يزداد تردد الإصابة بالالتهابات البكتيرية.