

## The effect of chronic diseases on microorganisms isolated from the urine of some patients admitted to Ramadi General Hospital

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### Abstract

**Background** Urinary tract infection is caused by infection of the urinary system with one of the microorganisms and the association of some chronic diseases in which diabetes is one of the main reasons that increase the severity of the disease, and people with this disease are more susceptible to infection. This study came .**Methodology** 80 urine samples were collected from patients suffering from chronic diseases, diabetes and kidney diseases in Ramadi General Teaching Hospital in Anbar Governorate, where 40 samples were from diabetics, 40 samples from kidney patients, and 40 were control **Where the shapes of the developing colonies, their cultivation characteristics and growth or non-growth on differential media were studied, the phenotypic characteristics are studied by making a cream dye from different culture media, and the shape and size of the colonies, color and viscosity . Result** diabetes mellitus on the number of microorganisms isolated from the management of some patients, where it was observed that there was an increase in the total number of pathogenic bacteria compared to the normal flora in people with diabetes compared to the control, where the number of coliform bacteria, Klebsiella and Staphylococcus bacteria reached 12700, 10400, 7500 compared to the normal flora 1600 in diabetic patients, and the number of the same bacteria in the control was 3000, 2700, and 2400, respectively, for the same bacteria compared to the natural fluorescence of 13400 in the uninfected persons.

**Keywords:** chronic diseases, microorganisms, urine of some patients.

## Introduction

*E.coli* is one of the most common pathogens responsible for more than 80% of UTIs<sup>(1,2)</sup> These bacteria are characterized by being small bacilli, ranging in size from 1.5-0.5 microns, and one of their characteristics is Gram-negative, motile by flagella, and some of its strains may possess a capsule, non-forming spores, facultative anaerobic, and it has an optimum temperature of 37°C for its growth and it can also grow Under wide thermal conditions (45-15°C)<sup>(3,4,5)</sup> Urinary opportunistic *E.coli* strains possess specialized virulence factors such as Pilli, and attach to uroepithelial cells by Fimbriae, which is the means of their binding to uroepithelial cell and increasing amounts of capsule antigen<sup>(6,7,8)</sup> *Klebsiella* bacteria are among the most pathogenic opportunistic agents responsible for all hospital-acquired diseases and because of their high ability to produce beta-lactamase enzymes, these bacteria have become resistant to many antibiotics<sup>(9)</sup> The ability of *Klebsiella* bacteria to cause disease is due to its ability to resist antibiotics, such as beta-lactamase, and it also has the ability to consume urea<sup>(10)</sup> *Klebsiella* is in second place among the genera of the intestinal family from a medical point of view, after the bacterium *Escherichia coli*, and *K.pneumoniae* is characterized and described as being more prevalent than other pathogens that cause urinary tract infections after *E.coli*<sup>(11,12)</sup> The adhesion of these pathogenic bacteria to epithelial cells is the first step of infection that can develop into a series of diseases, so the ability of bacteria to adhere to epithelial cells is the main factor in its pathogenesis<sup>(13)</sup> *Staphylococcus aureus* is one of the important pathogenic bacteria for humans, and it is a spherical bacterium that usually accompanies pus in wound infections, as this bacteria is considered one of the opportunistic pathogens of urinary tract infections. The pathogenesis of staphylococcus is characterized by its ability to hemolysis<sup>(14)</sup>

## Methodology

### Sample collection

80 urine samples were collected from patients suffering from chronic diseases, diabetes and kidney diseases in Ramadi General Teaching Hospital in Anbar Governorate, where 40 samples were from diabetics, 40 samples from kidney patients, and 40 were control

Identification of Isolated microorganism

### Cultural characteristics

Where the shapes of the developing colonies, their cultivation characteristics and growth or non-growth on differential media were studied, the phenotypic characteristics are studied by making a cream dye from different culture media, and the shape and size of the colonies, color and viscosity .

### Vitek compact2 system diagnosis

The Vitek2 diagnostic kit, produced by Biomeriux, was used to diagnose different bacterial isolates. One strip contains 64 small holes, each representing a chemical diagnostic test. Bacterial isolates were cultured on blood and Maconkey medium and incubated at 37°C for 24 hours. A homogeneous bacterial suspension, the bacterial density was read by Vitek DensiChek device, as the bacterial suspension had a specific reading ranging from (0.65-0.5). The information of the model used, and then the tubes were placed in the Phytech device, which reads the results automatically between 5-9 hours and determines the type of bacteria present in the stuck and then withdraws the results.<sup>(15)</sup>

## Result

**Table 1 The effect of diabetes mellitus on the total number of pathogenic bacteria and the normal flora isolated from the urine of patients**

<b>Dependent Variable: total count of bacteria</b>			
<b>case of patient</b>	<b>type of bacteria</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>Diabetic</b>	<b>E coli</b>	<b>12700.00</b>	<b>1567.021</b>
	<b>klebsiella</b>	<b>10400.00</b>	<b>1646.545</b>
	<b>staphylococcus</b>	<b>7500.00</b>	<b>1080.123</b>
	<b>lactobacillus</b>	<b>1600.00</b>	<b>567.646</b>
	<b>Total</b>	<b>8050.00</b>	<b>4386.459</b>
<b>control</b>	<b>E coli</b>	<b>3000.00</b>	<b>942.809</b>
	<b>klebsiella</b>	<b>2750.00</b>	<b>1184.389</b>
	<b>staphylococcus</b>	<b>2400.00</b>	<b>994.429</b>
	<b>lactobacillus</b>	<b>13400.00</b>	<b>2065.591</b>
	<b>Total</b>	<b>5387.50</b>	<b>4872.065</b>

Studies have found that patients with type 2 diabetes may suffer from UTIs more frequently and severely. People with type 1 or type 2 diabetes may have difficulty fighting infection. Also, if the infection spreads, the risk of kidney damage may increase. Therefore, it is important to know the symptoms of a urinary tract infection. Diabetes causes a weak immune system in the patient, which leads to making him more vulnerable to the presence of infections in the urethra that may multiply and form an abscess in the kidneys, so we present in this report the causes of urethral infections in patients with diabetes, and ways to treat them. diabetes affects the urethra both directly and indirectly. Regarding the direct, Salah explained that high blood sugar for long periods without treatment, leads to the accumulation of sugar in the blood, tissues and urine, and sugar in this case becomes a source of food for bacteria and has a fertile environment, which exposes the patient to infections in the urinary tract. Table 1 shows the effect of diabetes mellitus on the number of microorganisms isolated

from the management of some patients, where it was observed that there was an increase in the total number of pathogenic bacteria compared to the normal flora in people with diabetes compared to the control, where the number of coliform bacteria, Klebsiella and Staphylococcus bacteria reached 12700, 10400, 7500 compared to the normal flora 1600 in diabetic patients, and the number of the same bacteria in the control was 3000, 2700, and 2400, respectively, for the same bacteria compared to the natural fluorescence of 13400 in the uninfected persons.

**Table 2 ANOVA table of effect of diabetes mellitus on the total number of pathogenic bacteria and the normal flora isolated from the urine of patients**

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1690096875.000 <sup>a</sup>	7	241442410.700	135.997	.000
Intercept	3611328125.000	1	3611328125.000	2034.153	.000
case	141778125.000	1	141778125.000	79.859	.000
bacteria	100784375.000	3	33594791.670	18.923	.000
case * bacteria	1447534375.000	3	482511458.300	271.784	.000
Error	127825000.000	72	1775347.222		
Total	5429250000.000	80			
Corrected Total	1817921875.000	79			

a. R Squared = .930 (Adjusted R Squared = .923)

It is easy for the diabetic patient to detect inflammation of the urethra when he feels pain and burning in the urine, and the color of the urine changes, and this indicates the presence of a simple infection, but if it develops, these symptoms are accompanied by the presence of blood in the urine with a clear rise in body temperature. Women are more likely to have a UTI than men. An infection that's confined to your bladder can be bothersome and painful. But serious consequences may occur if the UTI spreads to the kidneys. Table 2 Analysis of variance for the effect of diabetes on the number of microorganisms in the urine of diabetic patients,

where it was noted that there are significant differences between infected persons in the increase in the number of bacteria and the decrease in the number of natural flora compared to the control, as well as there are significant differences between the types of pathological microorganisms, and there are also significant differences within the disease factor and the type of organisms Microscopic as shown in Table 3 comparison table

**Table 3 Comparison of the numbers of microorganisms between diabetics and non-diabetics**

Dependent Variable: total count of bacteria				
LSD				
(I) type of bacteria	(J) type of bacteria	Mean Difference (I-J)	Std. Error	Sig.
E coli	klebsiella	1275.00*	421.349	.003
	staphylococcus	2900.00*	421.349	.000
	lactobacillus	350.00	421.349	.409
klebsiella	E coli	-1275.00*	421.349	.003
	staphylococcus	1625.00*	421.349	.000
	lactobacillus	-925.00*	421.349	.031
staphylococcus	E coli	-2900.00*	421.349	.000
	klebsiella	-1625.00*	421.349	.000
	lactobacillus	-2550.00*	421.349	.000
lactobacillus	E coli	-350.00	421.349	.409
	klebsiella	925.00*	421.349	.031
	staphylococcus	2550.00*	421.349	.000

\*. The mean difference is significant at the .05 level.

We note in the comparison table that all types of bacteria isolated from diabetic patients gave significant differences when compared with the same types isolated from non-infected people, except for coliform bacteria with lactobacillus

**Table 4 effect of kidney diseases on the total number of pathogenic bacteria and the normal flora isolated from the urine of patients**

**Dependent Variable: total count of bacteria**

case of patient	type of bacteria	Mean	Std. Deviation
renal disease and stone	E coli	10710.00	3714.371
	klebsiella	10200.00	1619.328
	staphylococcus	6900.00	1523.884
	lactobacillus	1300.00	537.484
	Total	7277.50	4335.985
control	E coli	2600.00	1074.968
	klebsiella	2500.00	1178.511
	staphylococcus	2200.00	1159.502
	lactobacillus	8340.00	6380.561
	Total	3910.00	4126.015

In general, urinary tract infections are rarely dangerous, but they are uncomfortable. It's normally treated with antibiotics with a doctor's prescription, but if left untreated, the infection can spread from the lower urinary system to the upper urinary tract and kidneys. Such an infection might induce kidney damage or possibly renal failure. If this happens, the symptoms will grow substantially worse, for example: back pain, nausea and fever. The infection can enter the blood from the kidneys and spread to other regions of the body. This is a significant medical condition that requires intensive treatment. Table 4 shows the most microorganisms that cause UTI, which in turn affects the natural flora. It was noted that *E coli* bacteria are the most pathogenic microorganisms compared to *Klebsiella*, which ranks second in terms of infection with *staphylococcus* bacteria, compared to the normal flora whose numbers decreased and compared to the control. The total number of *E coli* bacteria, *Klebsiella* bacteria and *Staphylococcus* bacteria reached 10710, 10200, and 6900, respectively, compared to the natural flora of 1300, And compared with the control,

where the numbers respectively reached 2600, 2500, 2200 and the number of normal flora was 8300

**Table 5 ANOVA table of effect of kidney diseases on the total number of pathogenic bacteria and the normal flora isolated from the urine of patients**

	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1051293875.000 <sup>a</sup>	7	150184839.300	18.882	.000
Intercept	2503203125.000	1	2503203125.000	314.718	.000
case	226801125.000	1	226801125.000	28.515	.000
bacteria	67725375.000	3	22575125.000	2.838	.044
case * bacteria	756767375.000	3	252255791.700	31.715	.000
Error	572673000.000	72	7953791.667		
Total	4127170000.000	80			
Corrected Total	1623966875.000	79			

Women are more prone than males to have a urinary tract infection due to feminine anatomy. The urethra, which is shorter than that of a male, is also located close to the anus, a point of entry for germs into the urinary system. Additionally, estrogen levels diminish with aging in women. This results in the urinary tract walls being drier and thinner. Additionally, the protecting mucous membrane or mucous layer degrades in acidity, impairing its capacity to combat inflammation. A table of analysis of variance that shows the microorganisms that cause urinary tract infections, where it was noted that there are significant differences between the types of microorganisms compared with the normal flora and compared with the control, and there are significant differences between the disease cases and the control, and there are also significant differences between the interaction coefficients between microorganisms and disease states

**Table 6 Comparison of the numbers of microorganisms between cases of kidney diseases and healthy people**

**Dependent Variable: total count of bacteria**

**LSD**

(I) type of bacteria	(J) type of bacteria	Mean Difference (I-J)	Std. Error	Sig.
E coli	klebsiella	305.00	891.840	.733
	staphylococcus	2105.00*	891.840	.021
	lactobacillus	1835.00*	891.840	.043
klebsiella	E coli	-305.00-	891.840	.733
	staphylococcus	1800.00*	891.840	.047
	lactobacillus	1530.00	891.840	.091
staphylococcus	E coli	-2105.00-*	891.840	.021
	klebsiella	-1800.00-*	891.840	.047
	lactobacillus	-270.00-	891.840	.763
lactobacillus	E coli	-1835.00-*	891.840	.043
	klebsiella	-1530.00-	891.840	.091
	staphylococcus	270.00	891.840	.763

Based on observed means.

The error term is Mean Square(Error) = 7953791.667.

\*. The mean difference is significant at the .05 level.

Table 6 shows the comparison of people with urinary tract infection with healthy people in terms of the numbers of microorganisms, where it was noted that there are significant differences between the numbers of colon bacteria between Staphylococcus bacteria and the normal flora, and there is no significant difference between Klebsiella and there is a significant difference between Klebsiella with and with staphylococcus bacteria and there is no between them and bacteria Colon and normal flora In most cases, urinary tract infections are not dangerous, despite their discomfort. Although it is often treated with medicines obtained through a physician's prescription, if left untreated, the infection can spread from the

lower urinary system to the upper urinary tract and kidneys. This type of infection might result in kidney damage or possibly failure. If this occurs, the symptoms will deteriorate considerably, including back discomfort, nausea, and fever. From the kidneys, the infection can enter the bloodstream and spread to other regions of the body. This is a life-threatening medical condition that demands immediate attention.

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