

Studying the Effect of Some Physiological Factors and Some Antibiotics on Bacteria Isolated from Urinary Tract Infections

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ABSTRACT

This research included a study of some physiological factors and their impact on the bacteria that cause urinary tract infections, as well as a study of the effect of some antibiotics on these bacteria, as this disease is considered one of the most serious health problems facing large numbers of people annually. One hundred twenty individuals were suspected of having a urinary tract infection. Among the auditors to the health centers and Salah al-Din General Hospital, the samples were of different ages and for both sexes. The infection was diagnosed by examining urine in a laboratory. An examination of the drug sensitivity of the samples was conducted. , While the blood groups were determined using the antiserum, where 32 samples belonging to the genus *Escherichia coli* were diagnosed, 20 samples belonged to the genus *Staphylococcus*, and 18 samples belonged to the genus *Streptococcus*, the genus *Proteus*, the genus *Klebsiella*, and the genus *Enterobacter*, while only two samples belong to the genus *Candida albicans* and two samples It belongs to the genus *Aeromonas*.

The results have shown the following

- Females are more likely to be infected with the disease than males, as the infection rate in females was 50.0%, while the infection rate for males was 11.6%.
- Academic achievement did not have a "significant" effect on increasing or decreasing the number of patients with the disease.
- Individuals whose parents suffer from UTI are more likely to be infected with the disease compared to individuals whose parents do not suffer from an infection.
- Individuals living in the district center are less likely to be infected than those living in neighboring rural areas.
- There is no association between infection with urinary tract infection and blood groups.
- The study results showed that the highest infection rate was in the age group of 30-21 years, while the lowest infection rate was in the age group of 60-51 years, where the infection rate was 2.5%.
- Each of the strains of *E.coli* and *Staphylococcus* bacteria showed the highest rate of antibiotic resistance.
- While *Aeromonas* and *Candida's Albicans* showed the least resistance.

INTRODUCTION

Urinary Tract Infection (UTI) is an interesting health problem because it affects millions of people annually and is the second most important infection affecting the body.

There are three types of (UTI), including what happens in the bladder and is called Cystitis, and in the college. It is called (Pyelonephritis), and the third occurs in the urethra and is called (urethritis). The risk of (UTI) increases when any obstacle prevents the insertion of the generation of ease and ease through the urinary system ¹. Urinary tract infections are a state of arrival due to the injury of one or more organs of a member Members of the urinary system when one of the types of microorganisms can cross the strong natural defensive line; despite the strength of this defensive line, urinary tract infection is common and can be obtained at any age, and there are about 95 %of cases caused by the entry of bacteria from the opening and spread of the urethra To the bladder, in small cases, bacteria can enter the kidney through the blood ². The urinary system, consisting of the kidneys, ureters, and urethra, is one of the important organs in the human body due to the nature of the work it does in purifying the blood from harmful substances and substances over the body's needs and disposing of them in the form of urine. , and urine, its specifications and contents are good indicators that reflect the normal or pathological condition, in addition to other kidney functions in maintaining the normal balance of body fluids, that the widespread and unprecedented use of antibiotics has increased the problems of urinary tract infections (UTI), as this may be due to the continued use of these antibiotics vitality and for long periods, which led to the emergence of resistance shown by microorganisms and the emergence of strains with high antibiotic tolerance ³.

Bacteria are the main cause of many urinary tract infections, among other organisms responsible for the disease. Escherichia coli is one of the most important Gram-negative bacteria isolated from infected persons' urine samples ², ³. Also, urinary tract infections may be the only disease people suffer from. The secondary disease may result from other diseases, as the infection may be individual and associated with other conditions such as gastroenteritis, malnutrition cases, and acute respiratory infection. Urinary tract infection may be associated with cases of Patients; their genders and ages are more than related to the pathological symptoms of various cases of urinary tract infection. Therefore, urinary tract infection is one of the most serious health problems facing millions of people, especially among women, where the infection in women is more than the percentage of infection in men due to the shortness of the urethra, the absence of prostate secretions, pregnancy, and the ease of contamination by feces Intestine ⁴.

Another study showed that the incidence of (UTI) increases in sexually active women more than in other women ⁵, and this disease is not common among men. Still, it is considered dangerous if a man is infected with it. Urination is free from any bacterial, viral, or fungal contamination, and inflammation of the urinary tract occurs when bacteria reach the digestive system in the anus, which is very close to the outlet of the urinary tract and begin to grow and multiply. Inflammation may be caused by one type of bacteria, such as Escherichia coli, where inflammation begins. From the urethra of the penis, then it moves to the bladder, and if it is not treated, it moves to the ureters and, from there, to the kidneys. It can be transmitted in other ways, as the bacteria can pass from the blood to the kidneys or travel from the intestines to the bladder through the lymphatic vessels. People differ in the extent of their ability to contract the disease, as some are more susceptible to infection than others. Any defect in the urinary system that impedes the movement of urine or its obstruction

increases the ability to become infected due to urine stagnation. It provides an opportunity for bacteria to multiply. This disease is a common disease during childhood. Women who have contracted the disease are the most susceptible to infection, as studies have indicated the risk of recurrence of infection in women because there are factors that help bacteria in the cells lining the urine wall that help in the adhesion of bacteria and then transfer them to the urinary system, ⁶. He indicated ⁷ that special patterns of blood groups may have a role in the disease. The spread of the disease varies according to geographical health conditions. Where poor health conditions and malnutrition affect the incidence of many injuries ⁸. Many studies have shown that one of the causes of kidney damage is urinary tract infection, and that women with diabetes with a previous infection of the urinary tract, especially in the upper part of them, suffer more kidney damage compared to those who suffer from diabetes and do not suffer from urinary tract infection. It was found ⁹ that urinary tract infection is not limited to acute disease only, but also extends to chronic diseases, as it causes kidney failure, which leads to failure in kidney functions ¹⁰.

Target

Determining the effect of physiological factors such as Sex, age, blood group, parents' medical condition, residence, and educational attainment on infection with urinary tract infection bacteria and their resistance to antibiotics.

WORK METHODS

Sampling collection

Samples were collected from patients auditors to the Salahuddin Hospital Laboratory General and for a period from the beginning of November 2021 to the end of January 2022 after being referred by the specialist doctor and organized a questionnaire for collecting information from patients that included .:

(The name of the patient, age, Sex, housing, the condition of the previous parents of th same disease, blood type, academic achievement)

Microscopic examination*

The revenue samples were taken and placed in the test tubes in the centrifuge at a speed of (5000) rpm for (15) minutes, after which he neglected the candidate and took the deposit Deposit, then put a drop of it on a clean glass slice, put the slide cover on top of it and examined under the microscope when enlarged (40x) To reveal the purulent cells (Pus Cell) ⁹

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Planting on the circles*

Taking diversion samples and planted on appropriate agricultural circles, the Blood AGAR and Maconkey Agar, as all the generation samples were planted on the aforementioned agricultural circles for the purpose of isolating bacteria that cause urinary tract inflammation and then diagnosed using a number of traditional tests ⁹.

Blood groups examination*

ABO and RH domains are diagnosed by examining blood samples with a supply of well - known anti -anti -anti-biotics (Anti -antibiotics or antibiotics (D and an Agglutination between the blood sample and the antiserum indicates the antigen.

Resistance and Allergy Test : *

Test of the pharmacological sensitivity test for bacterial insulation under study for antibiotics from the process of equipping (Turkey, Bioanalyse Company (CLSI versions 2014)

***Statistical analysis**

The results were analyzed statistically "by using a Fi test regarding housing, Sex and health condition for parents, and I used compatibility coefficients regarding age, academic achievement and blood groups, while I used the I (X) box to indicate the connotation of the attachment between the qualities and the use of the computer ¹⁰ .

RESULTS

- Sex

The results of the current study showed, as Table No. 4, which included (120) individuals, showed that the number of males was (31) and the number of females (89), where the number of cases of infection among females reached (89: 60); as for the number of infected males, it was (31: 14) and the percentage of women was (50 %) and the percentage of the injured males was (11.6 %) and that the differences are moral (P> 0.05).

Table (1) shows the numbers of the injured distributed according to the Sex of the injured

the condition sex		Injured	Uninfected	the total
Male	the number	14	17	31
	percentage%	%11.66	%14.66	%25.83
Female	the number	60	29	89
	percentage%	%50	%24.16	%74.16
the total	the number	74	46	120
	percentage%	%61.16	%38.33	%100

It is noted in Table No. (5) that the number of parents suffering from individuals who suffer from injury was 2074: and by 16.6%, while the number of proper parents from the disease and whose children suffer from the injury 46:04, by 3.3%, and that the differences are moral (P> 0.05) , It is also noted in Table No. (3) that the number of mothers with individuals

suffering from the disease was 74:25 and by 20.8%, while the number of delivery mothers was for individuals suffering from 46:03, with a rate of 2.5%, and that the differences are moral ($P > 0.05$).

Table (2) shows the numbers of the injured and the non -injured and their percentage of the father's variable

Cases of injury the father		Injured	Uninfected	the total
Injured	the number	20	54	74
	percentage%	16.66	45	61.66
Uninfected	the number	4	42	46
	percentage%	3.33	35	38.33
the total	the number	24	96	120
	percentage%	23.33	76.66	%100

Table (3) shows the numbers of the injured and the non-injured and its percentage of the mother variable

Cases of injury the mother		Injured	Uninfected	the total
Injured	the number	25	49	74
	percentage%	20.83	40.83	61.66
Uninfected	the number	3	43	46
	percentage%	2.5	35.83	38.33
the total	the number	28	92	120
	percentage%	23.33	76.66	%100

Pharmacological sensitivity

Table No. (4) The results of bacterial insulation causing urology and the degree of resistance to the antibiotics used. The results of bacterial insulation varied in their resistance to these antibiotics, as the e.coli bacteria and Staphylococcus showed the highest percentage of resistant breeds. In contrast, Aeromonas and Candida Albicans showed the lowest resistance ratio, which that shows that E.Coli bacteria resisted the following antibiotics (NOR, CX,

STX, P, AMC, APX, CEP, OX, CFM, Met, GN, SXT) As for Staphylococcus bacteria resisted all antibodies except P.

Table (4) shows the number of bacterial species resistant to some antibiotics

Bacteria Anti Biotic	<i>E. coli</i>	<i>Staphylococcus</i>	<i>Streptococcus</i>	<i>Proteus</i>	<i>Klebsiella</i>	<i>Enterobacter</i>	<i>Aeromonas</i>	<i>Candida albicans</i>
P	6	-	1	-	-	-	-	-
AMC	4	5	1	-	-	4	2	2
APX	4	3	-	5	4	1	-	-
CEP	3	3	4	1	4	5	-	-
VA	-	4	-	-	-	2	-	-
CTX	3	4	-	1	-	-	-	-
OX	2	2	1	-	-	-	-	-
CFM	3	1	-	4	2	2	-	-
C	-	4	-	-	1	-	-	-
CX	1	4	2	-	5	5	-	-
NOR	2	5	-	3	2	-	-	-
MET	4	6	3	3	3	5	-	-
SXT	2	3	-	-	-	1	-	-
GEN	4	5	2	3	4	3	-	-

Blood groups -

It is noted in Table No. (8) that the number of people from the blood group O+ was 41:26, at 21.7% , And the number of people from the blood group A+ was 37:25, with a rate of 20.8%, and that the number of infected Blood B+ was 26:15, with a rate of 12.5%, and that the number of injured people from the blood group AB+ was 8: 8 and by 6.7% and that the differences are not moral ($p < 0.05$) .

Table (5) shows the numbers of the injured and the unjust

injury blood types	Cases of	Injured	Uninfected	the total
	the number	26	15	41
O+	percentage%	21.66	12.5	34.16
	the number	25	12	37
A+	percentage%	20.83	13.33	30.83
	the number	15	11	26

	percentage%	12.5	9.16	21.66
AB+	the number	16	8	16
	percentage%	13.33	6.66	13.33
the total	the number	120	46	120
	percentage%	%100	38.33	%100

Living -

It is noted in Table No. (9) that the number of people from the villages and rural housing was 96:54, with a rate of 45%, and the number of injured people from the residential center was 24:20, with a rate of 16.7%, and that the differences are moral($P > 0.05$).

Table (6) shows the numbers of the injured and the non-injured and the percentage of the housing variable

Cases of		Injured	Uninfected	the total
injury	Living			
Country	the number	54	42	96
	percentage%	45	35	80
City	the number	20	4	24
	percentage%	16.66	3.33	38.3320
the total	the number	74	46	120
	percentage%	61.66	38.33	%100

the age–

The injured persons were divided into (10) age groups, as shown in Table No. (7), where the number of injured people in the first category was 20:12, at a rate of 10 %, and the number of injured in the second category was 16: 7, at a rate of (5.8%); as for the number of injured people in the third category 52: 31, at a rate of 25.8%, while the number of injured in the fourth category was 13:10, at 8.3%, and the number of injured in the fifth category 9: 7, at a rate of 5.8%. As for the number of injured in the sixth category, it was 4: 3 , With a rate of 2.5%, the number of injured in the last category was 6: 4, with a rate of 3.3%, and that the differences between age groups were non -moral ($p < 0.05$)

Table (7) shows the numbers of injured, non -injured, and their rate of age

Cases of injury age categories		Injured	Uninfected	the total
10-1	the number	12	8	20
	percentage%	10	6.66	16.66
20-11	the number	7	9	16
	percentage%	5.83	7.5	13.33
30-21	the number	31	21	52
	percentage%	25.83	17.5	43.33
40-31	the number	10	3	13
	percentage%	8.33	2.5	10.83
50-41	the number	7	2	9
	percentage%	5.83	1.66	7.49
60-51	the number	3	1	4
	percentage%	2.5	0.83	3.33
70-61	the number	4	2	6
	percentage%	3.33	1.66	4.99
the total	the number	74	46	120
	percentage%	61.66	38.33	%100

-Academic achievement

Table No. (11) shows that the auditors were divided into (3) categories that, include the first category of educated with the intermediate certificate and above and includes the second category who are good at reading and writers and included the third category of illiterate, and the number of injured people for the three categories was respectively 43:24 50: 30 and 27:20 The infection rate was, respectively, 20%, 25% and 16.7%, and the differences were non – moral (0.05 p <).

Table (8) shows the numbers of the injured and the non-injured and the percentage of the academic achievement variable

Academic Achievement		Cases of injury		
		Injured	Uninfected	the total
learner	the number	24	19	43
	percentage%	20	15.83	35.83
Reads and writes	the number	30	20	50
	percentage%	25	16.66	41.66
my mother	the number	20	7	27
	percentage%	16.66	5.83	22.5
the total	the number	74	46	120
	percentage%	61.66	38.33	%100

DISCUSSION

The laboratory diagnosis of UTI is based on microscopic examination and bacteriological culture of urine samples ¹¹ and depends on the microscopic examination of the number of Pus Cells. Classification of patients as infected and non-infected.

Females are more susceptible to infection than males (Table 4), and the reason for this may be the proximity of the opening of the urinary tract to the anus in females, which facilitates upward infection more than males, and these results are consistent with what he found ¹².

It was noted that the Escherichia coli bacteria was one of the most common causes of urinary tract infection, and the reason for this is its natural presence in the alimentary canal and its ability to move into the urinary tract. This result was consistent with what was stated by ¹³.

As for the effect of the parents' health condition related to the same disease on the extent of the individual's disease (Tables 5 and 6), it was shown ⁷ that there are no genes related to the disease that is inherited from parents to children, and this can be attributed to health conditions and some health habits followed and thus the similarity in the extent of exposure to the causative agents of the disease.

As for the effect of blood groups (Table No. (8), the results indicated that there are non-significant differences, while the researcher ⁶ As for the study of infection according to age groups, the results showed that there is a non-significant effect for age groups, and according to our current study, most of the affected groups are (30-21), and the reason for this may be due to the transmission of bacterial infection from the infected wife to the husband or as a result of diabetes or Kidney stones, while the group (1-10) was the second age group at risk of infection, due to the weak immune system in this group. As for the effect of academic achievement on the disease (Table 11), study ⁹ indicated that the cultural level significantly impacts the incidence of the disease, while the differences were not significant. Salah al-Din

Governorate Health Directorate regarding health awareness and health practices in general and what is related to watery diarrhea in particular, which coincided with the period in which the study was conducted, and this matter, i.e., health culture, leads to health promotion.

As for the effect of housing (Table No. 9), the results showed that the percentage of infection among individuals living in the center of the district is less than the rate among residents in villages affiliated to the district, and these results are consistent with previous studies such as study ^{7,9} and it is believed that the reason is due to health awareness And to the reliance of the regions of the Elimination Center on sterilized water or sterilization pills, as well as the reliance of many of them on sterile and bottled water, and the reliance of the inhabitants of villages and rural areas on water equipped through the liquefaction network and relied mainly on the Tigris River, where quantities of pollutants reach it, especially what It reaches it from sewage and industrial water, In addition to "the increase in agricultural activity, which causes pollutants to reach that water, and that the entry of biological pollutants into the body increases the possibility of them reaching the urinary system through the lymphatic way or through their infiltration through the glomeruli with urine ⁹. As for the antibiotics used, it showed isolation of coli bacteria that are resistant to one or two antibiotics or several resistances to three or more antibiotics, and these antibiotics are PIP and AMC belonging to the group of penicillin and cystic fibrosis antibiotics. Cephalosporins) and the anti-GM of the group of aminoglycosides and the anti-nor group of the group of sulfonamides. This result agreed with what was stated by ^{8,9}. It also showed isolates of *Escherichia coli* resistant to the following antibiotics (APX, CEP CTX, SXT, OX)

These bacteria have a broad spectrum of resistance to many antibiotics, Betalacam Penicillins, Cephalosporins, and Monobaktam due to the production of Broad Spectrum Beitaquams resistant enzymes (Extended Spectrum β -Lactamses Esbls), and this makes the treatment list for patients with (UTIS) limited to other antibiotics that do not contain The beta-lactam ring ¹⁴.

As for *Staphylococcus*, it showed resistance to the following antibiotics (AMC, APX, CEP, VA, CTX, OX, CFM, CX, NOR, Met, Gen, SXT), while *Streptococcus* bacteria showed resistance to the following antibiotics (AMC, CEP, OX, CX, Met, SXT).

Antibiotics are very important in treating urinary tract infections, and by conducting antibiotic susceptibility tests to identify the extent of resistance to the germs under study, it has been noted that these germs have shown variation in their resistance, as shown in Table No. (7). It is clear from this Table that the highest rate of bacterial resistance was against the antibiotic sulfamethoxazole-trimethoprim, while the lowest rate of resistance of these bacteria was towards the antibiotic ceftriaxone, while it showed absolute sensitivity to staphylococci (100%). Vancomycin antibiotic and very high resistance to penicillin A G antibiotics. As it was found through these results that the antibiotics ceftriaxone and vancomycin are the best and can be recommended for use in the treatment of urinary tract infection in the event of the occurrence of such germs, perhaps the reason for the low resistance of these germs is due to the lack of exposure to these two types of antibiotics unlike other antibiotics Widely used for a long time

CONCLUSION

-1 -Females are more susceptible to the disease than males, as the infection rate in females was 50%, while the infection rate for males was 11.6%.

-2 -Academic achievement had no significant effect on increasing or decreasing the number of patients with the disease.

-3 -Individuals whose parents suffer from a urinary tract infection are more likely to develop the disease than individuals whose parents do not suffer from the infection, as the infection rate was 16.6% and 3.3%.

-4 -Individuals who live in the district center are less likely to be infected compared to those who live in neighboring rural areas.

--There is no association between infection with urinary tract infection and blood groups 5

6 -The study results showed that the highest infection rate was in the age group (30-21) years, while the lowest infection rate was in the old age stage (60-51) years, where the infection rate was 2.5%.

--The study showed that each strain of *E. coli* and *Staphylococcus* bacteria is the most bacterial strains causing urinary tract infections and the most resistant to antibiotics.

--The study showed that *Aeromonas* and *Candida albicans* strains were less resistant to antibiotics and less present in the urinary tract.

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