

## The microbiological causes of urinary tract infection among women attending medical institutions

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### Abstract

Urinary tract infections are the most common disorders a physician must deal with, both in outpatients and hospitalized patients. The data in this cross-sectional study was collected from the records of laboratory and statistical department in Tikrit Teaching Hospital (STH) in Tikrit City in August 2001. 16 women suffering from urinary tract infection, who were sent to the laboratory in Saddam Teaching Hospital from the outpatients clinic and the wards of the hospital for urine culture and sensitivity during the year 2000 were the sample in this study. This study shows the commonest age group of women presented with urinary tract infection is (20-29) years old in about (37.71%), especially in married women that present in about (65.6%), that caused most commonly by the staphylococcus aureus in about (36%) sensitive especially to Gentamycin in about (40.9%).

### Introduction

Urinary tract infections are the most common disorders a physician must deal with, both in the outpatients and hospital patients. Counting the costs of antibiotics and other treatments required, of hospitalization and the time lost from work, urinary tract infection presents a major problem for public health care in addition to the cost. Urinary tract infection causes considerable discomfort and inconvenience to the patient and are occasionally responsible for protracted symptoms or more serious manifestations such as sepsis and death.(1)

Moreover, nosocomial urinary tract infection are an important source of gram-negative septicemia and associated mortality.(2,3)

The population at risk of urinary tract infection includes newborn (including the premature), mature girls, sexually active females and elderly females.

Subsequently the length of treatment and the dosage used become shorter but still arbitrary, despite clinical trials showing that the duration of treatment was often still excessive. For example Kincaid- Smith and

Fairly (2) found that for chronic urinary infection a (2 week) course of ampicillin was effective as a (6 week) course. In complicated infections a 5-days course of ampicillin produced a (85%) cure rate.(3) Charlton et.al.(4) showed that in uncomplicated infection in general practice a 3-days and 10-days course gave similar results.

The majority of these infections occurs in the females and is related to sexual activity. Clearly one elements in this condition is personal hygiene, whilst it is possible for women to attend to their own personal hygiene and some do so obsessively, occasionally with unpleasant and unwanted results such as Irritant Urethritis or Vaginitis from caustic soaps, bubble baths, etc.. (6)

### Aim

To determine the most common microorganism that cause urinary tract infection in women and most effective antimicrobial agents, which are used in urinary tract infection.

### Objectives

1. Identify the most common organisms that cause urinary tract infection.
2. Clarify the relation between age and the occurrence of urinary tract infection.
3. Recognize the relationship between the marital status and urinary tract infection.
4. Identify the sensitivity of each microorganism causing urinary tract infection to different types of antimicrobial agents according to culture and sensitivity test.

### **Patients and methods**

The data in this cross – sectional study was collected from the records of the laboratory and statistical department in Tikrit Teaching Hospital in Tikrit City in August 2001. 61 women suffering from urinary tract infection, who were send to the laboratory in Tikrit Teaching Hospital for urine culture and sensitivity test, during the year 2000, were the sample in this study. The following information were sought for the age marital status, and the result of culture and sensitivity tests for urine. The data were processed by the group members manually and arranged in a master table. Then the results were displayed in tables, charts, graphs, by the use of Microsoft Excel and Word.

### **Results**

Figure (1): represent the most microorganism that causes urinary tract infection. The *Staphylococcus aureus* was the most microorganisms causing urinary tract infection in (22) cases in about (36.0%), while the *Pseudomonas aeruginosa* was the second microorganism that cause urinary tract infection in (12) cases in about (19.7%), *Escherichia coli* in (9) cases in about (14.8%), *Proteus mirabilis* in (6) cases in about (9.8%),

*Klebsiella aerogenes* in (2) cases in about (3.3%), and *Enterobacter* in (1) case in about (1.6%).

Figure (2): show the sensitivity of *Staphylococcus aureus* to different antibiotics according to culture and sensitivity test. In which the Gentamycin represent the most common antibiotics affect on *Staphylococcus aureus* in about (40.9%), then Cefotaxim (3rd generation Cephalosporine) represent the second antibiotics affect on *Staphylococcus aureus* in about (22.7%), others antibiotics that include: Ampicillin in about (18.2%), Rifamcin and Vancomycin have similar affect in about (9.1%).

Figure (3): show the sensitivity of *Pseudomonas aeruginosa* to different types of antibiotics according to culture and sensitivity test, in which the Nalidixic acid and Gentamycin have the same effect on *Pseudomonas aeruginosa* in about (25%), while the Vancomycin and Cefotaxime the second antibiotics that affect on *Pseudomonas aeruginosa* in about (16.7%), lastly the Ampicillin and the Polymixin have an equal in about (8.3%).

Figure (4): show the sensitivity of *Escherichia coli* to various types of antibiotics according to culture and sensitivity test, in which the Gentamycin was the most antibiotics that affect on *Escherichia coli* in about (33.34%), while Nitrofurantoin effect on *Escherichia coli* in about (22.22%), Cefotaxime effect on *Escherichia coli* in about (33.33%), lastly Chloramphenicol effect on *Escherichia coli* in about (11.11%).

Figure (5): explain the relationship between marital status and urinary tract infection. It was that in married women the urinary tract infection was in a higher percent

than unmarried women were (65.6%), (34.4%) respectively.

Table (1): shows the number and percentage of cases with urinary tract infection according to the age. The higher percent was between the age (20-29) years old in (23) cases in about (37.7%), the second age group was between (30-39) years old in (16) cases in about (26.23%), also between the age of (11-19) and (>40) years old in (11) cases for each age group were found that urinary tract infection occur in equal percent in about (18.03%).

### Discussion

From the result of the urine of the sample in this study, it was found that (36%) of them were growth of Staphylococcus aureus Which make it the most common cause of urinary tract infection in women (fig. 1). This result disagrees with the result found in other study conducted in Tikrit City which showed that the Escherichia coli was the most common cause of urinary tract infection.<sup>(5)</sup> While it agrees with the results of another study.<sup>(4)</sup>

From the analysis of the results of the sensitivity tests for urine cultures it was found that Gentamycin is the most effective antibiotics against Staphylococcus aureus (fig 2). This result agrees with the result obtained from another study, which showed that the resistance to Gentamycin is very minimal.<sup>(5)</sup>

In clarifying the significance of the relation between age and the occurrence of urinary tract infection, it was found that women aged (20-29) years old the most common age group affected with urinary tract infection (table 1). This can be explained by the fact that women in this age group of increased reproductive activity are most prone

to sexual activity, pregnancy, and delivery which predispose to introduction of microorganism to the urinary tract that lead infection. This is supported by other study, which showed that urinary tract infection is more prevalent among married women.<sup>(1)</sup>

### Conclusion

1. The most common cause of urinary tract infection in women in Tikrit City is Staphylococcus aureus.
2. Staphylococcus aureus is sensitive to Gentamycin.
3. The most common age group present with urinary tract infection in women is (20-29) years old.
4. Married women are more susceptible to urinary tract infection.

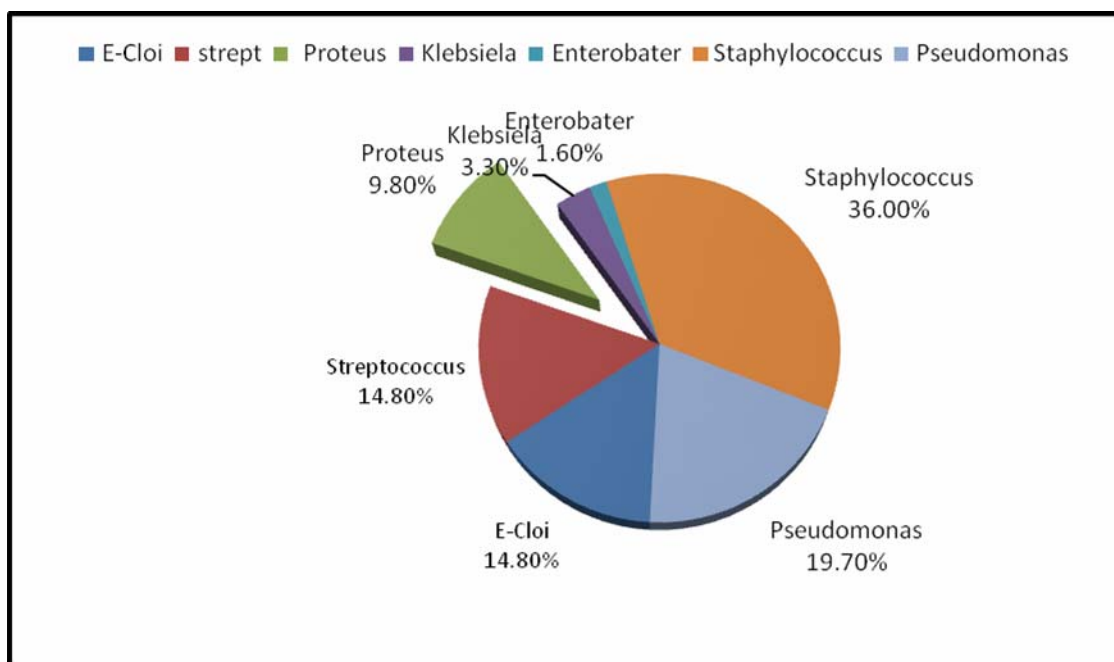
### Recommendations

1. To doctors:
  - a. All doctors should give a proper treatment depending on culture and sensitivity test.
  - b. All doctors should not give antibiotics haphazardly for urinary tract infection to prevent resistance.
2. To laboratory:
  - a. All staff of laboratory must be more accurate in doing culture and sensitivity test.
  - b. All staff of laboratory should know the proper way for collecting urine sample.
3. To community:
  - a. All women should not take any type of antibiotics without consultation from her doctor.
  - b. All women must consult her doctor if there is any symptoms of urinary tract infection to prevent complications.

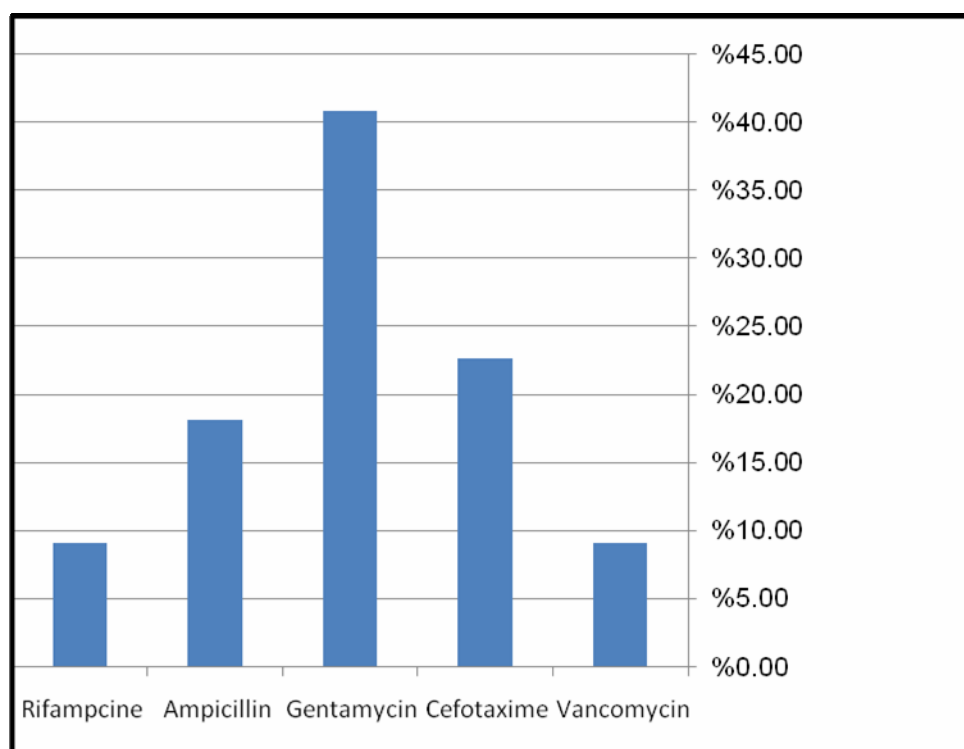
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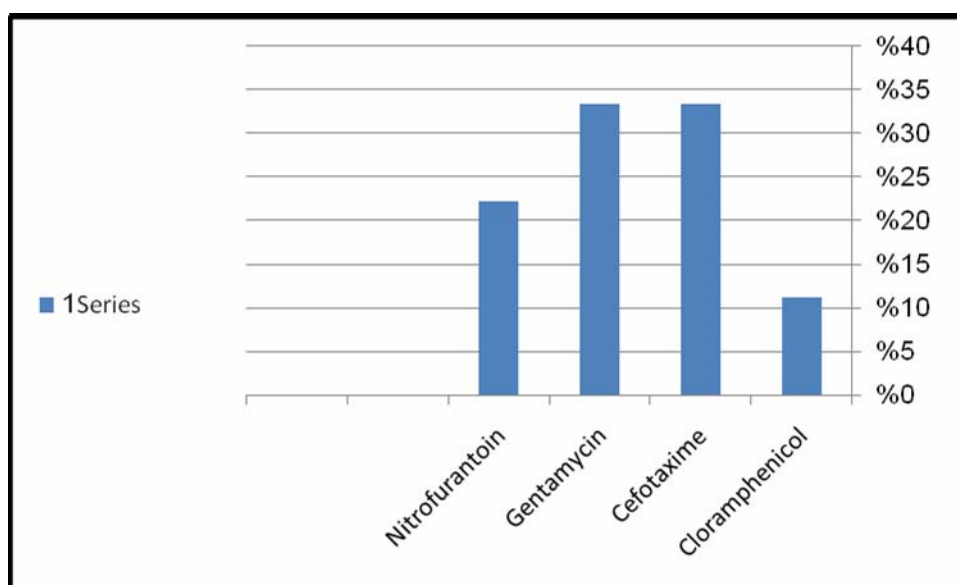
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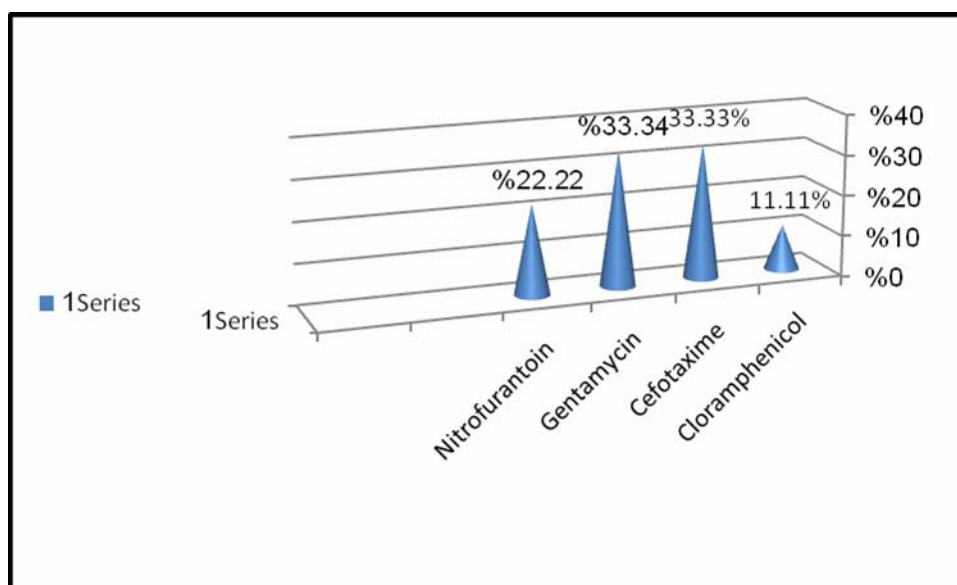
**Fig (1):** The percentage of each microorganism causing urinary tract infection



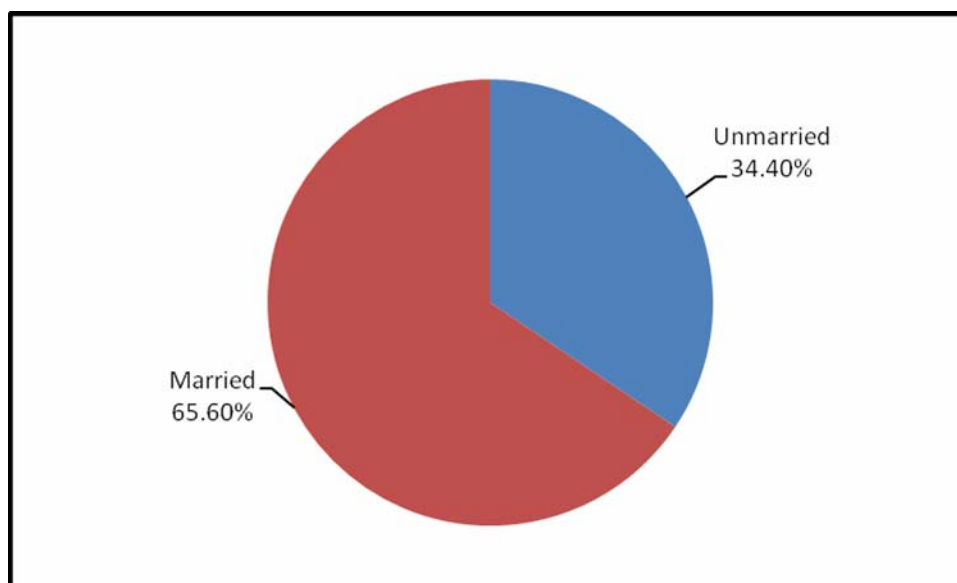
**Fig (2):** The sensitivity of staph. to different antibiotics according to culture & sensitivity test



**Fig (3):** The sensitivity of pseudomonas to different antibiotics according to culture & sensitivity test



**Fig (4):** The sensitivity of E-coli to different type of antibiotics according to culture & sensitivity



**Fig (5):** The percentage of urinary tract infection in relation to the marital status

**Table (1):** The relationship between age and occurrence of urinary tract infection.

Age in years	Number of cases	Percentage
11-19	11	18.03%
20-29	23	37.71%
30-39	16	26.23%
>40	11	18.03%
Total	61	100%

**Table (2):** The sensitivity of different microorganism to different antibiotics according to culture and sensitivity test.

Micro-organism	Cefotax-im	Vancomy-cin	Gentamy-cin	Ampicilin	Clindamy-cin	Rifamy-cin
<u>Proteus</u> Species	16.7%	33.3%	50%	-	-	-
<u>Streptococcus</u> pyogens	55.56%	-	-	22.22%	11.11%	11.11%
<u>Klebsiella</u> Aerogenes	50%	-	50%	-	-	-
<u>Enterobacter</u>	-	-	-	100%	-	-