

Research Article

Cross-Sectional Study Common Organisms and Their Susceptibility Pattern isolated in Urinary Tract Infection

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[Received: 10/02/2019; Accepted: 27/05/2019; Published: 30/05/2019]

ABSTRACT

Objective;To determine the various types of organisms and their susceptibility pattern, isolated from urinary tract infection.

Study design: Cross-sectional study.

Study Setting:Independent university hospital. Faisalabad. Some biochemical tests performed in molecular biology lab, department of biochemistry. UAF.

Study Duration: June to December 2018.

Methodology;In this study the cases were included from all the departments that presented with history of fever, burning micturition or as a part of pan culture for work up to find the site of infection with or without prior history of treatment. The types of organisms were isolated by conventional biochemical tests and susceptibility was tested by commercially available discs carrying variable modes of actions i.e. protein synthesis inhibitors, DNA synthesis inhibitors and cell wall synthesis inhibitors. These organisms were assessed for sensitivity in vitro against various antibiotics.

Results;In this study, there were 200 cases of culture positive urinary tract infection. Out of these 200, 56% were females and 44% males. The mean age of the subjects was 43.19±17.31 years. The most common organism isolated was E coli which was seen in 112 (56%) of the cases. It was followed by Klebsiella spp. which was observed in 34 (17%) of the cases, Enterococci were seen in 14% and Staph aureus in 10% of the cases.

Conclusion; The most common organism isolated in UTI is E coli seen in more than half cases.

Key words; UTI, E coli, Staph, Klebsiella.

INTRODUCTION

Urinary tract infection (UTI) is amongst the top causes of bacterial infection and is a very highly morbid and fata entity in older age groups. It is denoted as invasion leading to infection right from urethra to the kidneys and can results in a highly symptomatic and morbid clinical scenario.1-2. There are number of clinical features including

burning micturition, pain in flanks, decreased urinary output, fever, altered sensorium especially in the later age groups. Females are more prone to suffer from this infection courtesy shorter urethral length. Interventional procedures and Foleys catheter are the most common risk factors leading to its development. Urine complete analysis is the

investigation of choice any may need culture assessment and ultrasonography (USG) is needed to rule out any structural defects or complications.3-4.

The antibiotic therapies are immensely affecting the whole scenario of infectious organisms, their resistance pattern and their virulence as one of the highest issues are irrational use of the antibiotics where unnecessary and broader spectrum usage of drugs for simple infections is the major concern. The other factors to influence are non-compliance, lack of local anti-bio gram data and early changes in selection of antibiotics prior to give a proper time to heal the infection. That all led to a higher degree of resistance pattern. All the developed countries carry out anti biograms to assess for the most common bugs isolated from the infectious sites and the most potent and effective drugs leading to its eradication. This helps to select the prophylactic choice of antibiotics in cases presenting with same signs and symptoms. 4-5.

The most common organisms isolated in the past from various national and international studies suggested that *Escherichia coli* (E Coli) is the most common organism isolated. This is followed by various others depending upon the individual scenarios and site of data collection and included *Klebsiella* spp. *Enterococci*, *staph aureus*, *Proteus mirabilis*, *Pseudomonas* etc.6-8 That's why this study was planned to see the common organisms and their drug susceptibility pattern in our population to guide further for management plans.

MATERIAL AND METHODS;

This cross-sectional study was carried out during June to December 2018 at Independent university hospital. Faisalabad. Some biochemical tests

performed in molecular biology lab, department of biochemistry. UAF. In this study 200 cases were selected via non-probability consecutive sampling. The cases were included from all the departments that presented with history of fever, burning micturition or as a part of pan culture for work up to find the site of infection with or without prior history of treatment and either mid-stream urine or sample through foleys catheter. The types of organisms were isolated by conventional biochemical tests and susceptibility was tested by commercially available discs carrying variable modes of actions i.e. protein synthesis inhibitors, DNA synthesis inhibitors and cell wall synthesis inhibitors. These organisms were assessed for sensitivity in vitro against cephalosporins, aminoglycosides, imipenem, tazocin, colomycin, Vancomycin and macrolides.

Statistical analysis:

SPSS version 24.0 was used for data analysis and the categorical data was presented as frequencies and percentages, while numerical one as mean and standard deviation.

RESULTS

In this study, there were 200 cases of culture positive urinary tract infection. Out of these 200, 56% were females and 44% males. The mean age of the subjects was 43.19 ± 17.31 years as shown in table I. The most common organism isolated was *E coli* which was seen in 112 (56%) of the cases. It was followed by *Klebsiella* spp. which was observed in 34 (17%) of the cases, *Enterococci* were seen in 14% and *Staph aureus* in 10% of the cases (table II).

Table III reveals the susceptible drugs to these organisms.

Table No I. Study demographics

	Frequency	%
Male	88	44%
Female	112	56%
	Mean±SD	Range
Age (years)	43.19±17.31	15-81
Temperature (F)	100.71±2.11	99-104
Duration of symptoms (days)	5.19±2.27	1-15

Table No II. Types of organisms isolated

Organism	Number	Percentage
E Coli	112	56%
Klebsiella spp.	34	17%
Enterococci	28	14%
Staph Aureus	20	10%
P. aeruginosa	5	2.5%
P. Mirabilis	1	0.5%

Table No III. Drug susceptibility pattern

Organism	Susceptible drugs
E Coli	Imipenem, Tazocin, Amikacin
Klebsiella spp.	Imipenem, Ceftazidime, Amikacin
Enterococci	Imipenem, Tazocin, Amikacin
Staph Aureus	Linezolid, Colomycin, Vancomycin
P. aeruginosa	Imipenem, Piperacilin, Ceftazidime
P. Mirabilis	Imipenem, Amikacin, Azithromycin

DISCUSSION

Urinary tract infection is the 2nd leading cause of bacterial infection after the respiratory tract infections. These are usually benign and respond well to antibiotics. But it can be highly fatal in older age groups and in those cases where there are recurrent infection due to mechanical obstructions like stricture, stones and have indwelling catheters and need recurrent courses of antibiotics. There are the cases where irrational antibiotics have led to more virulent and resistant strains of the bacteria augmenting more broad spectrum antibiotics [9-11]. In the present study, the most common organism isolated was E coli which was seen in 112 (56%) of the cases. It was followed by Klebsiella spp. which was observed in 34 (17%) of the cases, Enterococci were seen in 14% and Staph aureus in 10% of the cases. These results were comparable to the findings of the studies done in the past. According to a study done by Setu SK et al, they found E coli as the most common pathogen and it was seen in 63.93% of the cases isolated from urinary tract cultures. In their study the 2nd common pathogen was Klebsiella pneumoniae which was seen in 17.09% and the other common pathogens were also similar like the present study and were staph aureus, psueomonas, enterocci etc [12].

In another study done by Akhtar A et al they also found most number of cases as gram negative bacteria which were seen in 21% of the isolates and gram positives were 16%. The most common bug in their study was E coli seen in 20% of the gram negative ones. It was also followed by Klebsiella [13]. According to another study by Magale HI et al, on 948 cases, it was observed that the most common organism isolated was E coli seen in 30% and Klebsiella in 18% of the cases [14]. In this study E coli was most sensitive to Imipenem, Tazocin and Amikacin while Klebsiella to Imipenem, ceftazidime while staph aureus to the Linezolid, Vancomycin and Colomycin. These results were also according to the susceptibility patterns of the other studies [15-17].

CONCLUSION

In this study, there were 200 cases of culture positive urinary tract infection. Out of these 200, 56% were females and 44% males. The mean age of the subjects was 43.19±17.31 years. The most common organism isolated was E coli which was seen in 112 (56%) of the cases. It was followed by Klebsiella spp. which was observed in 34 (17%) of the cases, Enterococci were seen in 14% and Staph aureus in 10% of the cases. The most common organism isolated in UTI is E coli seen in more than half cases.

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