THE CLINICAL AND ETIOLOGICAL PROFILE OF URINARY TRACT INFECTION

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ABSTRACT

Objectives: *To study clinical profile of urinary tract infection (UTI) and to document the common microorganisms causing UTI in admitted patients and to test their sensitivity pattern.*

Material and Methods: *We did a hospital based descriptive study in the department of Medicine Khyber Teaching Hospital, Peshawar from December, 2005 to July, 2006. The data of total 50 patients above 13 years of age with signs and symptoms suggestive of UTI was collected on a structured proforma. The clinical presentation, the common causative organisms and their sensitivity pattern was documented. The results were compared with other national and international studies.*

Results: *In this study 47/50 (94%) cases were culture positive with a colony count >105/ml. Overall male to female ratio was 1:2 table.1. Among the culture positive cases, the commonest pathogens found were E. coli in 25 cases (53.1%) followed by citrobacter in 8 cases (17.02%). The commonest organisms E.coli and citrobacter showed maximum sensitivity to Amikacin, ofloxacin, ciprofloxacin and ceftriaxones, in decreasing order of frequency. The most common symptom found in all age groups was fever while the commonest sign was anaemia.*

Conclusion: *UTI should be considered in any patient with fever without focus beyond three days. E Coli is the commonest organisms and amikacin is the drug of choice.*

Key words: *UTI, Clinical Profile, Causative Agent, Urine Culture and Sensitivity, Complications.*

INTRODUCTION

Urinary tract infections (UTI) are a common health problem and are amongst the most common infections described in the out patient department.[1,2] UTIs are also the most common infection in acute and long term care hospital patients and in patients in nursing homes.[3,4]

It has been estimated that 8% of girls and 2% of boys will have a UTI during childhood. During infancy boys are more affected than girls but in childhood, girls out number boys.[5]

It is an important cause for a variety of symptoms; it may be overlooked and ultimately may lead to substantial morbidity and serious consequences. Awareness about its potential hazards in general practice is negligible. About 50% of affected children will have structural or functional abnormalities and 10-20% will have renal scars and other will have hypertension and chronic renal failure leading to end stage renal disease. It is essential to give special attention for identification of those with complicated UTI.[6]

In the developing countries, the disease has more prevalence due to poor personal hygiene, life style, malnutrition and environmental condition. The disease is caused by wide variety of micro organism and at different locations of urinary tract system. The most commonly isolated bacterial pathogen, whether community acquired or hospitalized patients UTI is Escherichia coli (E. coli) [7-9] and the urethera and urinary bladder are the most frequent sites of infections within the urinary tract.

Present study was designed as to study clinical and etiological profile of urinary tract infection patients admitted to a tertiary acre hospital of Peshawar and to test their sensitivity pattern.

AGE AND SEX DISTRIBUTION

Age group	Male		Female	
	Frequency (n=17)	%age	Frequency (n=33)	%age
13-20 years	04	8%	08	16%
20-40 years	06	12%	12	24%
40-60 years	04	8%	10	20%
Above 60	03	6%	03	6%

Table 1

MATERIAL AND METHODS

This descriptive study on clinical and etiological profile of patients with urinary tract infections above 13 years of age was carried out from December, 2005 to July, 2006 in Medical "C" unit of Khyber Teaching Hospital, Peshawar.

Inclusion criteria: Patients of different age and both sexes were included in the study. The criteria for cases selection was:

1. All patients above 13 years of age, both male and female with fever and pyuria on urine routine examination.
2. Patients with recurrent fever or having pyrexia of unknown origin.
3. Patients who were off the antibiotics at least 72 hours prior to urine collection.

Exclusion criteria: were all patients who had same clinical picture but with negative urinary culture

All data including histories and physical examination were recorded on pre-designed proforma.

Methods of urine sample collection: Urine specimens were collected by mid stream, clean catch method. Urine was collected in sterilized bottles. Urine was sent for routine examinations and culture immediately after collection without storage. After taking urine samples, all symptomatic patients were put on empirical antibiotics till the availability of culture sensitivity report. The definite diagnosis of UTI was based on urine culture showing significant growth colony count> $1x10^5$ organisms /ml of a single pathogen. As the study is a cross-sectional descriptive, one mainly focused on finding the etiology of pathogens causing UTI in patients, frequency tabulation was done for the findings.

RESULTS

A total of 50 patients were included in the study, lasting for 8 months. In the study, 47 (94%) cases were culture positive with a colony count of $>10^5$/ml and the remaining 3 (6%) cases were culture negative. The over all male to female ratio was 1:2 (table 1) in this study.

Among the culture +ve cases (n=47), the commonest pathogens found were E. Coli in 25 (53.1%) cases (Table 2). Escherichia coli was the only species to have sufficient numbers to obtain followed by citrobacter in 8 cases (17.02%), proteus in 6 cases (12.7%) staph. aureus in 4 cases (8.5%) and klabsiella in 3 cases (6.3%). Pseudomonas, was not found in any case out of 50 cases significant pyuria (pus cells $\geq$ 10/mm^3) was found in 20 patients and among these 18 cases were culture +ve.

The commonest organisms i.e. E. coli & citrobacter still shows maximum sensitivity to aminoglycosides (Amikacin), 3rd generation cephalosporins & quinolones. A significant number of these organisms are found resistant to commonly used first line antibiotics like ampicilin, cotri-maxazole.

CAUSATIVE ORGANISMS OF UTI NUMBERS AND PERCENTAGES OF ORGANISMS ISOLATED

Bacteria	Frequency (n=47)	%age
E.Coli	25	53.1%
Citrobacter	8	17.02%
Proteins	6	12.7%
Staph aureas	4	8.5%
Klebsiella	3	6.3%

Table 2

SENSITIVITY REPORT OF THE MOST COMMON ORGANISMS

Name of Drug	Percentage of E. Coli sensitive	Percentage of citrobacter sensitive
Amikacin	96.0%	92.0%
Tienam	90.0%	90.0%
Ciproxin	70.0%	85.0%
Fortum	70.0%	80.0%
Rocephin	69.0%	60.0%
Gentamycin	66.0%	62.0%
Cefotaxime	60.0%	60.0%
Amoxicillin clavulanic acid	55.0%	50.0%
Zinacef	40.0%	60.0%
Nalidixic acid	35.0%	30.0%
Cefspan	38.0%	35.0%
Orelox	35.0%	25.0%
Negram	30.0%	30.0%
Cefaclor	30.0%	35.0%
Urixin	20.0%	25.0%
Velocef	15.0%	14.2%
Ampicillin	12.8%	10.2%
Cotrimoxazole	10.8%	8.5%

Table 3

In table No3 the sensitivity of these two common organisms is given in detail. Various clinical features associated with UTI were also evaluated.

The most common symptom found in all age groups was fever. The commonest sign was anaemia. In the patients up to age 50 specific urinary symptoms of UTI were common while in elderly patients, the presentation of UTI was usually by non specific signs and symptoms. The common associated problems are shown in table 4.

DISCUSSION

The UTI cannot be diagnosed properly with base line routine examination of urine as pyuria is absent occasionally in the condition and the diagnosis is missed. The culture sensitivity test of urine is important for the diagnosis of UTI and generally recommended / advised in cases of dysuria, frequency of micturation and burning, and pyrexia of unknown origin. In the present series admitted patients have been found to have more culture positive results as compared to out door patients. This may be due to properly selected cases by experienced clinicians and the back ground of urinary tract disease requiring admission. Present data also highlighted that females had more bacterial growth as compared to males, might be due to improper use of tampons, duchess, vaginal swabs, menstruation, gynecological examination, sexual intercourses and short urethra. This study documented urinary tract infection in female to male ratio of 2:1, while the study[10] done by D.J farrel et al (UK surveillance of UTI pathogens) shows 4:1 ratio. In this study E. Coli was found to be the commonest organisms (53.1%) causing urinary tract infection. Many other studies done by Ronald, A 2003,[11] Schlager, T-A, 2001[12] and Najmul Hassan 2000[13] also isolated E.Coli in majority of cases.

The following specific bacterial virulence factors explain the reasons why E.Coli is the most common uropathogen.

1. The presence of P. fimbriae recognize and attach to a specific carbohydrate receptor present on human uroepithelial cells.
2. Hemolysin production
3. High quantity of K. antigen in the capsule of bacteria which has been shown to shield bacteria from complement lysis and phagocytosis.[14,15]

In this study the commonest organism (E. Coli) is mainly sensitive to amikacin (92%), imipenam (90%), ciprofloxacin (85%), which are in accordance with other national and international studies done by Mohammad Tariq et al 2000[16],

COMMONEST SYMPTOMS AND SIGNS OF PRESENTATION IN CULTURE POSITIVE CASES

Clinical features	Number of cases (n=47)	%age
Fever	30	63.8%
Irritability	20	42.5%
Vomiting	18	38.2%
Pallor	15	31.9%
Frequency	11	23.4%
Foul smelling urine	8	17.02%
Pain Flanks / hypogestrium	7	14.8%
Edema feet	6	12.7%

Table 4

Ayarew K, - et al[17].

As far as antibiotic resistance is concerned, E.Coli was mostly resistant to commonly used antibiotics like Co traimaxazole, ampicillin and cephradin. The irrational use of first line antibiotics at primary health care level is the leading cause of increasing resistance to these commonly used drugs. The free availability of these drugs with out the prescription by a qualified doctor is also a major factor. In countries where there are strict prescribing rules, E.Coli is still sensitive to cotrimaxozle and Co amoxiclave.[18,19]

Among the clinical features fever was the commonest, followed by vomiting & irritability. In the study done by Lettegen, B et al [20] shows likely results.

CONCLUSION

Culture sensitivity test is important because most of the patients with UTI are treated blindly with different antibiotics. The main organism causing urinary tract infection is E. Coli followed by citobactor and proteus. The symptoms of UTI may be different in different patient's bur fever and dysuria are the commonest symptoms while anemia is the commonest sign. In the present study a high percentage of resistance was found to contrimaxazole & ampicillin, therefore in blind therapy of suspected urinary tract infections, amikacin, tienam, ciprofloxacin and 3rd generation cephalosporin are the drug of choice.

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