

## A clinical and Microbiological study of Urinary tract infection in elderly- A hospital based Study

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### ABSTRACT

#### Introduction:

Urinary tract infection is the second most common cause of community acquired infection and main cause for nosocomial infection in the elderly. In contrast to *E. coli* which is the commonest cause of urinary tract infection in the general population, Gram Negative Bacilli like *Pseudomonas* and *Enterococcus* often are isolated in the elderly patients with UTI.

#### Material and methods:

Among the 64 patients, 31 were found to be female and the rest 33 were male patients. Besides the clinical evaluation- history and clinical examination, Routine Examination of urine and Bacterial culture and sensitivity were done using MacConkeys Agar media and radiological investigations - Ultrasonography abdomen and CT (KUB and pelvic organs) were done as and when required.

#### Results and observations:

A total of 64 patients were included in our study over a period of 6 months. Out of this, 31 were female and rest 33 were male patients. Increased frequency of urination was the most common presenting symptom followed by fever with chill and rigor. Atypical presentations like acute confusional state and burning micturition was also found in a few patients. The most common organism was *E. coli* followed by *pseudomonas*, *enterococcus*, *citrobacter*, *methicillin sensitive staphylococcus aureus*, *Candida*, *Klebsiella* and *Acinetobacter* with varying degrees of anti microbial sensitivity

#### Conclusion:

A high index of suspicion is very much essential for diagnosis of UTI in elderly as they present with atypical manifestations. Besides *E. coli*, a wide variety of organisms like *pseudomonas*, *enterococcus*, *citrobacter*, *methicillin sensitive staphylococcal aureus*, *Candida*, *Klebsiella* and *Acinetobacter* infections are found in elderly patients with urinary tract infections.

Urine examination for Culture sensitivity for microbial susceptibility should be carried out in elderly patients with urinary tract infections.

#### Key words:

Urinary tract infection (UTI), Elderly, Microorganisms, Antimicrobial Sensitivity

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### I. Introduction

Urinary tract Infection is defined as an infection in any part of the urinary system, the kidneys, bladder or urethra. UTIs are more common in women. They usually occur in the bladder or urethra, but more serious infections involve the kidney. Typical presentation of UTI in elderly patients- frequency, urgency and dysuria with fever with chills and rigor, flank pain and tenderness. UTI remains the second most important cause of community acquired infections and the main cause of nosocomial infection among elderly<sup>1</sup>. Depending on the presence of an underlying disease or comorbid conditions, the prevalence of UTI in elderly male patients and female patients range within 5-35% and 15-50% respectively<sup>2</sup>. In contrast to general population where the cause of UTI is *E. coli* in 90% patients, in the elderly population it is within a range of 60-70%. Other Gram negative bacilli *Pseudomonas*, *Citrobacter*, *Klebsiella*, *Acinetobacter* and *Enterococci* are often isolated in the elderly population presenting with UTI<sup>3</sup>. UTI is much more common in the female population than in male patients due to the anatomic and physiologic variability<sup>4</sup>. UTI in elderly do present with atypical manifestations. The presenting organisms causing UTI in elderly are very often different from that in the young population. So a thorough evaluation of the symptoms and signs by proper history taking and clinical examination is essential for adequate treatment of UTI in elderly. The study was conducted in a tertiary care hospital to elicit the clinical profile of UTI in the elderly population and to find out the etiological causes and drug susceptibility pattern.

## II. Materials And Methods:

The study was conducted at a tertiary care hospital over a period of six months. The total patients that were enrolled in the study were 64 patients presenting with symptoms of UTI and urine examination showed significant pyuria (Pus cells  $\geq 5$  cells/hpf) under microscopic examination. Clean catch mid stream samples of urine were collected and urine culture and bacterial sensitivity test was done using Mac Conkey agar media. Patients with growth of multiple species of bacteria in urine culture or colony count  $< 10^3$ /ml were excluded from our study.

## III. Results and observations:

A total of 64 patients in the age group  $\geq 60$  years with Urinary tract infection were included in our study. Out of the 64 patients, 31 were female patients and the remaining 33 were male patients. Increased frequency of micturition (81%) was the most common presenting feature followed by fever with chill and rigor (56%) of patients. Hesitancy and diminished mid stream urine was present in 25% of the patients. Patients with different co-morbid conditions like Hypertension (75%), anemia (43.3%), Chronic Obstructive Lung Disease (35%), Cardiac disease (13.3%), kidney disease (5%) and prostatic hypertrophy (4.8%) are less ambulatory and are bed ridden and suffer from recurrent UTI. Various risk factors like diabetes mellitus were present in 8.3%, genital prolapse in females (5.8%), prolonged catheterization was present in 11.6% patients. More than half of the patients with UTI had complications (56.6%).

Bacteriuria was present in 75% of cases followed by hematuria (8.3%), glycosuria in 8.2% and proteinuria in 6.6% patients.

### Number of Patients with Various Risk Factors

Risk factors	SEX		TOTAL	Percentage
	MALE	FEMALE		
1. Diabetes	3	2	5	8.33 %
2. Prostatic Hyperplasia	17	0	17	28.3 %
3. Genital prolapse in females	0	11	11	11.6 %
4. patients on prolonged catheterization	5	2	7	18.3 %

### Number of Patients with different Co-morbid conditions

Co Morbid Condition	Male	Female	Total	Percentage
Hypertension	13	32	45	75.00 %
Cerebro Vascular disease	05	02	07	11.67%
Anaemia	07	19	26	43.33%
Renal disease	01	02	03	5.00%
Cardiac disease	05	03	08	13.33%
COPD	04	17	21	35.00%

### Table showing various Isolated Organisms from Urine Culture

Sex	E Coli	Klebsiella	Pseudomonas	Enterococcus	Staph Aureus
Male	06	03	07	01	02
Female	26	03	03	06	03
Total	32	06	10	07	05
Percentage	53.33 %	10%	16.67%	11.67%	8.33%

E coli was the most common organism isolated in our patients (55.3%) followed by Pseudomonas (16.7%), Klebsiella (10%), Staph aureus and Enterococci were gram positive bacteria isolated in 8.3 and 11.6% respectively in our elderly patients who presented with UTI. All organisms were sensitive to Flouroquinolones, Piperacillin-Tazobactam, Imipenem, Nitrofurantoin. Ecoli showed resistance to 1<sup>st</sup> and 2<sup>nd</sup> generation Cephalosporins. Klebsiella species showed resistance to Flouroquinolones and also to 1<sup>st</sup> and 2<sup>nd</sup> generation Cephalosporins. Pseudomonas was resistant to Flouroquinolones and also to 1<sup>st</sup> and 2<sup>nd</sup> generation Cephalosporins. Staphylococcus species was resistant to 1<sup>st</sup> and 2<sup>nd</sup> generation cephalosporins and Enterococcus were resistant to Flouroquinolones and also to 1<sup>st</sup> and 2<sup>nd</sup> generation Cephalosporins.

#### IV. Discussion:

The study showed an increase prevalence of UTI in females in the ratio of 2:1. The finding of female preponderance in the elderly UTI patients do corroborate with the findings of different studies in India and the Western countries.<sup>5,6,7</sup>

5% of the elderly population presented with atypical symptoms like mental confusion. Thomas et al showed that upto 30% of elderly patients with UTI may present with atypical symptoms. The study showed that 8.3% Diabetic patients were at risk of developing UTI, other studies like Behl et al and Sathe et al showed 30% patients with Diabetes Mellitus had recurrent UTI. Bori et al showed both benign prostatic hyperplasia and female genital prolapsed resulting in residual urine with a high risk of development of UTI in elderly. Urinary catheterization is associated with development of UTI. Catheter associated UTI is the most common hospital acquired infections. Kothari et al reported an incidence of 30% catheter associated UTI in elderly patients.

E coli was the most common organisms grown in 53% of urinary samples, growth of Pseudomonas was observed in 16% of urinary samples. Enterococcus was grown in 11 % of urinary samples whereas Klebsiella was found in 10% of the urinary samples. Staphylococcus was grown in 8.3% of the urinary samples. Though E coli is responsible, 90% of UTI in adults, the incidence in elderly is around 54% (Shalini et al) whereas Pseudomonas and Klebsiella infections are found to be more frequent, followed by Klebsiella (21%), Pseudomonas (11.2%), Enterococcus (11.2%). Upto 20% of E coli shows resistance to 1<sup>st</sup> and 2<sup>nd</sup> generation cephalosporins and 12.5% of E coli showed resistance to 3<sup>rd</sup> generation cephalosporins. Upto 20% Pseudomonas are resistant to Flouroquinolones and 1<sup>st</sup> generation cephalosporins and 10% of Pseudomonas showed resistance to 3<sup>rd</sup> generation cephalosporins. Among the Klebsiella species 28.5% showed resistance to flouroquinolones and 16.6% of Klebsiella species showed resistance to Cephalosporins.

#### V. Conclusion

A high index of suspicion is essential for the diagnosis of Urinary tract infection in the elderly population as it is one of the most common infection and it may sometimes present with atypical manifestations. E. coli was found to be the most common organism followed by Pseudomonas, Citrobacter, Klebsiella, Acinetobacter, Staph aureus and Enterococci. The organisms showed varying degrees of resistance to flouroquinolones and cephalosporins in Culture Sensitivity tests done in our laboratory. So in the elderly population presenting with UTI, urine culture sensitivity testing for microbial susceptibility to antibiotic should be carried out in UTI in elderly patients. The incidence of UTI rises in the elderly as the muscles in the bladder and pelvic floor gets weakened. The first signs of Urinary tract infections in elderly are frequent need to urinate, a constant feeling of fullness of bladder and pressure or pain in the abdomen or lower back. Around 10% of women older than 65 years of age have history of recurrent UTI. The number increases to almost 30% over the age of 85 years. In addition, untreated Urinary tract infections can develop into serious kidney infections, putting elderly population at risk of organ damage and potentially fatal systemic infections like sepsis.

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