

## A Retrospective Study To Assess The Resistance Profile Among Pathogens Causing Urinary Tract Infection In Pediatric Population At A Tertiary Hospital

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**Abstract:** Urinary tract infection is one among the most commonly diagnosed infection of childhood. Frequent unwanted unwarranted usage of antibiotics does more harm. Its important to know the sensitivity pattern in the community. Method: A total of 75 children were included in the study. Culture and sensitivity patterns were checked. Statistical analysis was done on frequency and mean.

**Results:** More of females were found in the study. E.coli was the most common organism isolated. Culture and sensitivity test were done only for few patients. The most frequent empirical antibiotic used was ceftriaxone and cefixime.

**Interpretation And Conclusions:** The high prevalence of drug resistance among UTI patients calls for continuous monitoring of the incidence of drug resistance for appropriate empiric selection of antibiotic therapy. Empirical treatment of UTIs should be relied on susceptibility patterns from local studies.

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### I. Introduction

Urinary tract infection (UTI) is among the most commonly diagnosed bacterial infections in children.(1) Its estimated that approximately 150 million people get affected with this disease each year. Its seen more frequently among women when compared to men..(2)At an average, up to 10% of women have a urinary tract infection in a given year and half of women having at least one infection at some point in their lives the incidence is more among reproductive age group, pregnant females and immunocompromised.(3) In pediatric cases, incidence of UTI varies with age of the child. 5% of children < 2 years with fever are diagnosed to have UTI. In the first year of life, especially in the first 3 months, UTI is more common in boys (3.7%) than in girls (2%).(4) Thereafter, incidence of UTI among girls is more.. Children ,especially females are at risk of developing UTI due to certain anatomic and physiologic factors among which vesicoureteric reflux (VUR) is the most common. VUR results in repeated infections and other complications like chronic pyelonephritis and eventual renal scarring which are components of reflux nephropathy(4,5) It can be caused by bacteria, fungus or virus. The most common organism causing UTI is Escherichia coli (E. coli), 80–85%(1) followed by Staphylococcus saprophyticus being the cause among 5–10% patients. Risk factors include female anatomy, poor hygiene, children(5) ect.

- Urinary tract includes urethra, bladder, ureter and finally kidneys. Its divided in to lower urinary tract and higher urinary tract. Lower urinary tract includes urethra, bladder and part of ureter.Upper includes part of ureter and kidneys.The most common cause of lower urinary tract infection is poor hygiene and structural pathology is main stream cause in upper. Symptoms of lower urinary tract include burning micturition, frequent urination, and urgency despite having an empty bladder.Symptoms of upper urinary tract include fever,chills and rigor and flank pain with symptoms of a lower UTI.(2) The main problem with lower urinary tract infection is that it can ascend and reach the upper part and cause severe form of UTI, pyelonephritis and in extreme cases chronic renal disease. Hence early diagnosis and is critical to preserve renal function of the kidney.
- It can be symptomatic or asymptomatic. It is classified in to complicated and uncomplicated. Uncomplicated ones are mild form and can be treated with short course single antibiotics like nitrofurantoin or trimethoprim/sulfamethoxazole. Complicated one's may not be controlled with monotherapy and multidrug therapy may be warranted usually IV.In this era of development of resistance to most of the antibiotics, drugs prescribed for UTI too follow the the pattern .This multiple resistance can complicate the normal course of treatment. (6-8) Normally,natural commensal protect us from such infections.In case of UTI,lactobacillus does.But these natural commensal get destroyed by antibiotics(8-10). Unwanted and unwarranted prescription of antibiotics to treat without knowing the sensitivity pattern of the disease causing organism can do more harm than good. Hence,it calls for a study on the sensitivity pattern of organism causing UTI among patients attending out tertiary care Hospital.

### Objective

- To evaluate the frequency of bacteria causing UTI and their relevant drug resistance patterns among adults hospitalized in Father Muller Medical College Hospital.

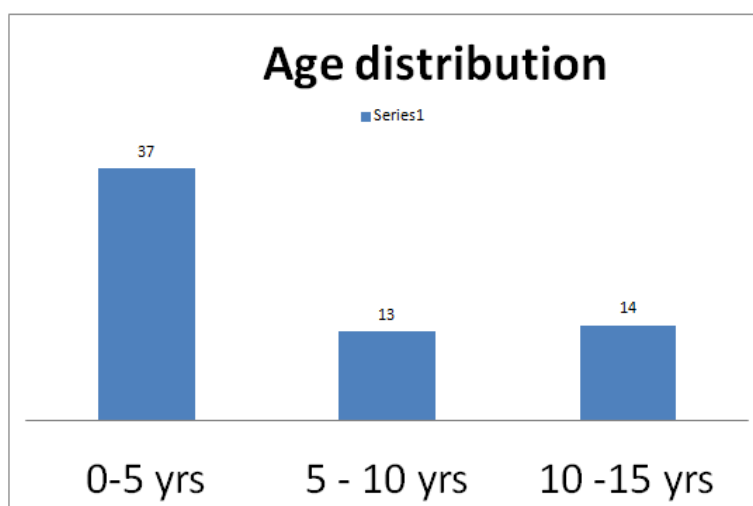
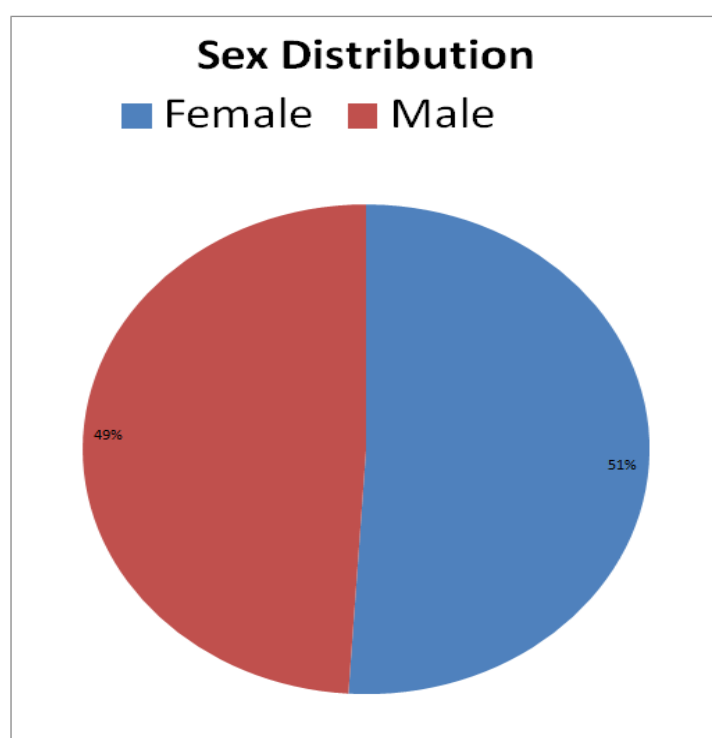
## II. Methods

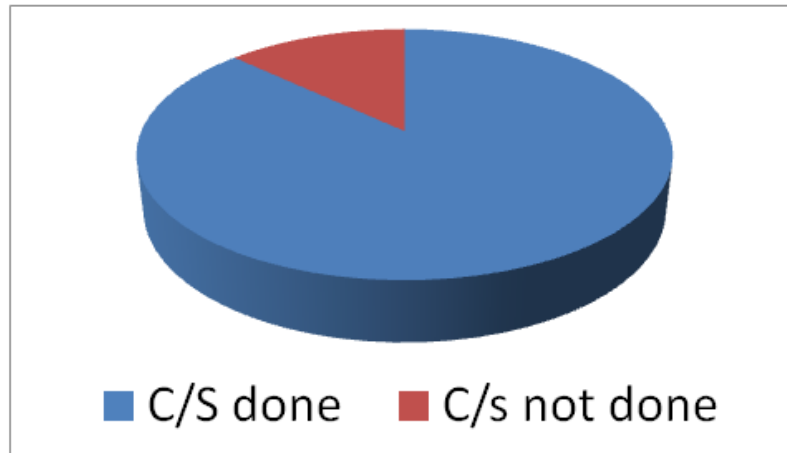
- Study type : Retrospective
- Sample size : Patients admitted during a period of 3months from December 2015
- Data regarding patients with urinary tract infection admitted in FMMCH was collected from the Medical Records Department and analyzed.

**Statistical analysis:** The whole data was entered in excel sheet and calculation part was done by frequency and mean.

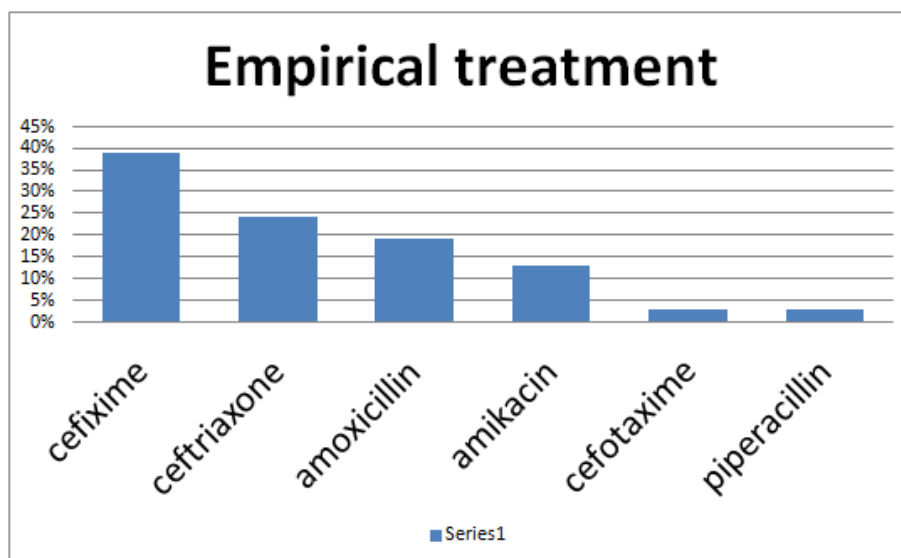
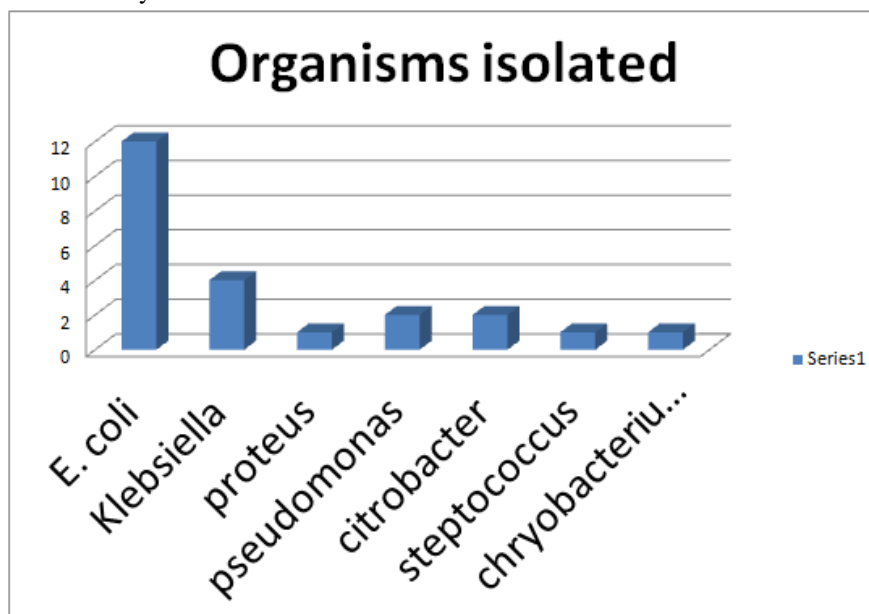
## III. Results

- 75 patients were included in the study.
- Most common symptom was fever.
- Urine culture was positive in 37% of sample.
- The most frequent uropathogens isolated were Escherichia coli and Klebsiella.
- The E.coli isolates had a resistance rate of 77.7% to ampicillin ,amoxicillin clavulanate and cefazolin.
- The most frequent empirical antibiotic used was ceftriaxone and cefixime.





C/S – Culture and Sensitivity



	E. Coli		Klebsiella	
	R(%)	S(%)	R(%)	S(%)
Ampicillin	78	22	100	-
Amoxyclav	78	22	45	55
Cefazolin	78	22	100	0
Cefuroxime	67	33	75	25
Ceftriaxone	56	44	73	27
Cotrimoxazole	33	67	46	54
Gentamicin	22	78	54	46
Amikacin	-	100	17	83
Ciprofloxacin	67	33	50	50
Nitrofurantoin	-	100	82	18
Levofloxacin			33	67
Piperacillin/ Tazobactam	-	100	30	70
Cefoperazone/ Sulbactam	11	89	8	91
Imipenem	-	100		100
Meropenem	-	100	9	91
Colistin	-	100		

#### IV. Discussion

In our study 51 % were females.

In a study done by Shaikh N and others found UTI was more common among females which holds same with our study.

- Most patients were in the age group 0-5 yrs which was similar to a study done in north India where 25.6% were infants & 38.7% between 1-5 yr age
- The most frequent uropathogens isolated were Escherichia coli and Klebsiella.
- In a study done in north india (1)Common uropathogens isolated were Escherichia coli (47.1%), Klebsiella spp. (15.6%), Enterococcus fecalis (8.7%), Protease (5.9%), Pseudomonas aeruginosa (5.9%) and Candida (5.5%).
- Majority of the *E.coli* isolates were sensitive to amikacin, nitrofurantoin, imipenem ,piperacillin-tazobactam meropenem.
- In another study done in pondicherry resistance was least against amikacin , nitrofurantoin and imipenem . (8,9)
- Inappropriate selection and usage of antimicrobials will not only promote antibiotic resistance but will also result in treatment failure.
- This in turn will increase the morbidity of the disease and treatment related expenditures.
- Increasing antibiotic resistance is a global and regional challenge
- There is an urgent need to rationalise the usage of antibiotics in Indian hospitals

#### V. Conclusion

*E. coli* was the most frequent pathogen. We found that *E. coli* had a high resistance rate against ampicillin, amoxicillin clavulanate and cefazolin. In order to ensure a successful empirical treatment, physicians should consider local epidemiology and susceptibility rates. The rate of bacterial resistance to ciprofloxacin observed in the studied population is much higher than expected, prompting the need for rational use of this antibiotic

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