

ORIGINAL ARTICLE

MICROBIOLOGICAL PROFILE IN URINARY TRACT INFECTIONS AMONG CHILDREN

Khurram Hayat¹, Rehana Barkat²¹RMO cum Clinical Tutor, Pediatric Medicine, R. G. Kar Medical College and Hospital, Kolkata, India²Demonstrator, Microbiology, Malda Medical College, Malda, West Bengal 732101, India**ABSTRACT:**

Background: Urinary tract infection (UTI) is a typical bacterial contamination in kids. Early determination, treatment in light of the anti-microbial affectability example of the causative microorganisms and assessment for fundamental innate irregularities of the urinary tract are critical to counteract confusions and renal inadequacy. To examine the current clinical profile, bacteriology and anti-infection affectability example of urinary tract contaminations in kids in a some portion of the western locale of India. **Materials and methods:** An aggregate of 300 "mid-stream" urine tests were gotten from suspected UTI patients in Microbiology Department, India over a time of 8 months. They were tested microbiologically and antimicrobial susceptibility tests were performed for the separated pathogens. Recognition of Extended Spectrum Beta-Lactamase (ESBL) creation in gram negative living being and Methicillin substance in Staphylococcus was completed. **Result:** Significant bacteriuria represented 72 (24%) of total 300 examples. UTI was more common in girls contrasted with boys. The general contamination rate was most astounding in the age gathering of 8-12 years. Escherichia coli was the most widely recognized uropathogen separated took after by Klebsiella spp and Enterococcus spp. Isolated pathogens were sensitive to Nitrofurantoin, Amikacin and indicated resistant to Ampicillin, Norfloxacin and Co-trimoxazole. **Conclusion:** The usually separated uropathogens have a changing resistance design because of aimless utilization of anti-infection agents bringing about lessened adequacy and well being of the treatment. Anti-microbial vulnerability designs must be constantly and intermittently assessed to choose the proper regimen to treat UTI and to keep away from entanglements.

Keywords: UTI, Pathogens, Antibiotic resistant.

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INTRODUCTION:

Urinary tract contamination (UTI) includes the disease of kidneys, ureters, bladder, or urethra by pathogenic attack of the urinary tract, which at last prompts an incendiary reaction of the urothelium. All people might be helpless to UTIs; be that as it may, the predominance of contamination contrasts with age, sex and certain inclining factors.¹ The frequency of disease is more noteworthy in females than in males with two special cases, infants and the catheter related contaminations. Ladies have a tendency to get UTIs all the more frequently in light of the fact that their urethra is shorter and nearer to the anus than men and henceforth the pathogenic microscopic organisms get fast access to the bladder.² UTI is viewed as critical and requires treatment when more than 100 microorganisms for each ml of urine are available in a legitimately gathered example. Uropathogenic Escherichia coli causes 90% of the UTIs in anatomically-

ordinary, unhampered urinary tracts. After Escherichia coli, the most well-known UTIs pathogens incorporate S. saprophyticus, Enterococcus spp., Pseudomonas aeruginosa, Candida spp., Klebsiella pneumonia, Proteus spp. furthermore, Enterobacter spp. Gathering B streptococci are unprecedented pathogens in UTIs in youthful healthy ladies.³

Strikingly, the pathogens generally connected with UTI are known to change numerous of their elements, especially because of their antimicrobial resistance designs. In spite of the fact that anti-infection agents are the pillar treatment for all UTIs, the expanding pattern of resistance in bacterial pathogens is of overall worry that can shift as indicated by geological and provincial areas.³ Most UTIs are caused by Gram-negative microscopic organisms like Escherichia coli (E. coli), Klebsiella spp., Proteus mirabilis, Pseudomonas aeruginosa, Acinetobacter spp., and Serratia spp. furthermore, Gram-positive microscopic organisms, for

example, *Enterococcus* spp. and *Staphylococcus* spp. *E. coli* is capable to generally UTI's.^{4,5} Medication resistance among microscopic organisms causing UTI has expanded since prologue to UTI chemotherapy. The etiological operators and their helplessness examples of UTI change in districts and geological area. Also, the etiology and medication resistance change through time.⁶⁻⁸

Learning of the neighborhood bacterial etiology and weakness designs is required to follow any change that may have happened in time with the goal that refreshed proposal for ideal exact treatment of UTI can be made. Various investigations have been done on the commonness and antimicrobial resistance examples of UTIs. Nonetheless, no information have been accounted for from the present investigation region. The point of the present investigation was subsequently to decide the commonness of neighborhood bacterial confines from suspected UTI and vulnerability to antimicrobials.

MATERIALS AND METHODS:

Urine samples were gathered from 300 child patients experiencing UTIs for this examination and the specimens were investigated at Microbiology research facility in North India. Subsequent to gathering the examples aseptically, tests were centrifuged and analyzed microscopically to identify the nearness of white cells (pus cells), red cells, yeast cells, epithelial cells, parasites, cysts and so on.

For bacteriological investigation, Mac Conkey agar (MAC) and Blood agar media were utilized. With an adjusted circle of 3 mm breadth, the fittingly named media plates were streaked aseptically with 0.02 ml urine test. The plates were then hatched vigorously at 37°C for 24 hrs. Bacterial

distinguishing proof was finished by examination of the overnight culture and Gram-staining. Standard biochemical tests were performed likewise to recognize the microscopic organisms of intrigue. Agar disc dispersion examine was utilized to decide the bacterial vulnerability to various antibiotics towards microorganisms in vitro.

RESULT:

Total 300 samples were taken out of which 72 were suspected of having UTI. Out of 72, 34 were boys and 38 were girl patients; with majority lies in 8-12 years age group. The age and gender wise distribution of children from whom the urine samples were collected is shown in Table 2. The most widely recognized living being causing the urinary tract disease in this examination was *Escherichia coli* (n=36). Other were *Enterococcus* spp. (n=11), *Klebsiella* spp. (n=9), *Proteus* spp. (n=2), *Pseudomonas* spp. (n=3), *Staphylococcus saprophyticus* (n=4), *Staphylococcus aureus* (n=5). *E. coli* (21 from male and 15 from female) and *Enterococcus* spp. (6 from girls and 5 from boys) were the most well-known microorganisms detached from both male and additionally female patients. Correspondingly *E. coli* and *Enterococcus* spp. were the most widely recognized detaches in all age gathering. Appropriation of pathogens disengaged from urine tests were indicated Table 2. Among the 50 gram-negative microbes, *E. coli* demonstrated most resistant to Ampicillin and Ciprofloxacin and Levofloxacin separately while it indicated less resistance to Nitrofurantoin. *Pseudomonas* spp., demonstrated 100% imperviousness to Ampicillin sulbactam, Cotrimoxazole and Nitrofurantoin while less imperviousness to Levofloxacin.

Table 1: Clinical features of children with suspected UTI

Variables	Total number of patients
Sex	
Boys	34
Girls	38
Age	
1-4 year	8
4-8 year	16
8-12 year	26
12-16 year	22
Clinical features	
Fever	35
Dysuria	19
Diarrhea	9
Constipation	4
Pain in abdomen	29
Frequency of urination	17
Decrease appetite	15

Table 2: Pathogens isolated from urine samples:

Microorganisms	No. of isolates (n=72)
Gram negative	
Escherichia coli	36
Klebsiella	9
Pseudomonas	3
Proteus	2
Gram positive	
Enterococcus	11
Staphylococcus saprophyticus	4
Staphylococcus aureus	5
Fungus	
Candida	2

Table 3: Antibiotic susceptibility of gram negative organism

Antibiotics	E.coli (36)	Klebsiella(9)	Pseudomonas(3)	Proteus(2)
Ampicillin	28	6	3	2
Cotrimoxazole	21	5	3	2
Ceftriaxone	24	5	0	2
Nitrofurantoin	7	6	3	2
Levofloxacin	31	7	0	1
Ciprofloxacin	30	7	1	2
Norfloxacine	26	6	1	1

Table 4: Antibiotic susceptibility of Gram-Positive organism

Antibiotics	Enterococcus(11)	Staphylococcus saprophyticus(4)	Staphylococcus aureus(5)
Cotrimoxazole	5	4	3
Ampicillin	8	4	5
Norfloxacine	9	4	5
Ciprofloxacin	9	4	4
Cephoxitin	5	3	5
Levofloxacin	8	4	5
Linezolid	4	3	5
Cephalexin	7	4	4

DISCUSSION:

UTI is a typical contamination in kids. Out of 300 patients enlisted and researched for UTI, 72 had noteworthy bacteriuria. The male to female in our investigation was 38:36, with females more than guys in all the age gatherings. Different investigations have additionally demonstrated a female prevalence with a male: female proportion shifting from 1:1.3 to 1:2.⁹⁻¹¹ Boys are more helpless to UTI in the main year of life. From that point, females are at expanded hazard because of a shorter urethra and its nearness to the butt which empowers pollution and rising of fecal verdure into the urinary tract.

Most extreme number of patients in our examination were in 8-12 years age gather which is not quite the same as concentrates by Sharma et al,¹² Malla et al¹³, Singh et al,¹⁴ and Benachinmardi et al¹⁶ who have announced greatest number of patients (differing from 35-50%) in 1-5 age gathering. Be that as it may, Gupta et al¹⁷ and Gadge et al discovered greatest number of patients (56.5% and 37.7%, individually) in the age gathering of under 1 year.^{17,18}

Fever was the most widely recognized manifestation in our examination. Different examinations have additionally observed it to be the most widely recognized side effect introduced in 45 - 87% of their patients. The other normal manifestations noted were pain in guts, urinary side effects which connects with different investigations. Infant exhibited with nonspecific side effects like fever, poor sustaining, looseness of the bowels and peevishness while more seasoned youngsters had urinary indications and agony in guts with or without fever.

Escherichia coli was the most widely recognized species (50%) distinguished in our investigation as saw in different examinations from different parts of India and furthermore from various nations over the world. In our investigation disconnection of Gram-positive cocci was 15% among which Enterococcus was the most widely isolated. Gram-positive microorganisms have gotten more consideration these days as a reason for bacteriuria and UTI. Despite the fact that Streptococci spp. are seen in little numbers, they are perceived as an essential reason of UTI.+Candida species were confined in 2.7% which is

relatively low contrasted with different investigations by Chander and Singla¹⁹ (7.80%) and Rekha et al.²⁰ (4%). In pediatric patients confinement of *Candida* species for the most part demonstrates urinary tract anomalies and rashness. Candiduria needs prompt also, genuine consideration as it could be the main indication of spread candidiasis in this age gathering.

Out of 50 gram-negative separates, the four most elevated watched resistances were for Ampicillin/sulbactam took after by Norfloxacin, Ciprofloxacin and Levofloxacin demonstrating over medicine of these medications.^{21, 22} The usually utilized antibiotics, for example, Nitrofurantoin, Ampicillin/sulbactam and Co-trimoxazole were ineffectively successful against greater part of the creatures disconnected in this investigation. High rate of detaches demonstrated resistance to sulfa medications, for example, Cotrimoxazole that is line with past discovers by Tambekar et al.²³ Anti-infection affectability and resistance design fluctuate after some time and places. The examination demonstrated a high imperviousness to antimicrobials like Ampicillin, Co-trimoxazole, Ciprofloxacin, Norfloxacin; could be these anti-toxins were as a rule use for a long stretch. This examination gives a look at developing antimicrobial resistance design. This sort of study ought to be done intermittently to survey the example of microorganisms causing UTI and their antimicrobial susceptibility, which will manage in choice of anti-infection agents for the empiric treatment.

CONCLUSION:

Urinary tract contamination is a typical bacterial disease in kids. Females are more influenced than guys. High predominance of fever and other nonspecific side effects particularly in babies and youthful kids bolsters the requirement for screening all febrile youthful kids for UTI. Conclusion must be founded on a positive urine culture as this has suggestions for point by point assessment for innate variations from the norm and development. as the most regular causative life form for UTI has not changed however its affectability for cephalosporins, ciprofloxacin and amoxicillin-clavulanic corrosive is low in our area.

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