

## Changing Etiology and Antibiogram of Urinary Isolates from Pediatric Age Group

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**To The Editor:** Pediatric UTI often remains an under-diagnosed clinical entity in primary care [1]. Usually, the presentation of UTI is variable with nonspecific signs and symptoms. But it is important to diagnose the condition as it could be the first presentation of an underlying urological anomaly [2] or it may in itself, lead to significant morbidity from renal scarring, hypertension or eventually renal failure [1].

Predominance of Gram negative organisms, especially *Escherichia coli* (*E.coli*) in the cases of UTI, has been reported since long, gastrointestinal tract being the main reservoir for these causative organisms. Isolation of urease producing organisms like *Klebsiella*, *Pseudomonas* and *Proteus* species is furthermore important as they can lead to complicated UTI. Current retrospective study conducted over a period of three years from April 2003 to March 2006 confirmed the same age old findings along with some new aspects.

A total of 2294 urine samples (1379 from male children and 915 from female children) were obtained from pediatric patients suspected of having UTI and were processed by standard laboratory methods [3,4] during this period. Seven hundred and ninety nine samples were found positive for bacterial isolates giving an incidence of 34.82%. Four hundred and seventy seven (59.70%) samples from male children and 322 (40.30%) samples from females were culture positive. Age-wise distribution of culture positivity in males was 45.58% in age group less than one year, 33.86% in age group 1-5 years, 26.15% in 6-10 year and 25% in age group 11-14 years, while in females it was 40.42%, 32.97%, 34.24% and 32.96% respectively. Of the 799 culture positive children, 858 isolates (70.62% outpatients and 29.37% inpatients) were obtained. In 59 samples, growth of two organisms (polymicrobial infection) was obtained which was within significant limits as per the Kass criteria [5]. Growth of three or more than three organisms was considered as mixed flora and the samples were not processed further. Gram negative isolates were 718 (83.68%) with *E.coli* 483 (56.29%) being the predominant one followed by *Klebsiella* species 102 (11.88%), *Pseudomonas aeruginosa* 65 (7.57%) and *Proteus* species 30 (3.49%). However, among inpatients, organisms belonging to *Enterococcus* species 57 (6.64%), *Staphylococcus* species 16 (1.86%) and *Enterobacter* species 9 (1.04%) predominated. Another important feature was isolation of *Candida* species in 67 (7.80%) cases. In pediatric patients, isolation of *Candida* species mostly signifies urinary tract abnormalities and prematurity [6]. Furthermore, candiduria needs serious attention as it could be the first manifestation of disseminated candidiasis in this age group [6].

Antimicrobial susceptibility testing was performed by the modified disc diffusion method of Stokes as per the recommendations of Clinical and Laboratory Standards Institute (CLSI) [7]. Study of antibiogram (Table) revealed that the resistance levels were higher in inpatients than outpatients. Among Gram negative organisms belonging to Enterobacteriaceae, resistance was highest for cotrimoxazole (94%), amoxicillin/ampicillin (83%) and ciprofloxacin (64.3%) indicating that the use of these drugs alone may be ineffective. A previous study from India [8] had also reported higher levels of resistance, up to 60-80% in pediatric patients against fluoroquinolones.

The reason for such high levels of resistance could be their widespread use, easy availability and over the counter sale [8]. Among cephalosporins, ceftriaxone showed highest resistance (41.7%) and that too in inpatients, which could be due to ESBL production. Such isolates are rampant in hospital settings nowadays due to overuse of these drugs [9]. Amikacin was found to be a better alternative.

Organisms responded well to cefoperazone-sulbactam. In comparison, non fermenters showed more resistance to almost all the antibiotics than organisms of Enterobacteriaceae (Table). Among Gram positive organisms, the level of resistance was very high to all the drugs used (58%-90%) except amoxicillin-clavulanic acid (35%). All the strains were sensitive to linezolid and vancomycin. About 50% of *S.aureus* strains from inpatients were resistant to oxacillin.

In conclusion, although the main etiological agents causing UTI have not changed much over the years, the resistance among them is definitely increasing. High prevalence of methicillin resistance in *Staphylococcus aureus*, over expression of ESBL and MBL in nosocomial Gram negative pathogens is further worsening the situation and making the treatment difficult by severely limiting the options available.

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