ORGANISMS CAUSING URINARY TRACT INFECTION IN PEDIATRIC PATIENTS AT AYUB TEACHING HOSPITAL ABBOTTABAD

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Background: Urinary tract infection (UTI) is common in pediatric practice and an important cause of morbidity and mortality in children. Infected urine stimulates an immunological and inflammatory response leading to renal injury and scarring, ultimately leading to end stage renal failure. The present study identifies the micro organisms causing urinary tract infection in children presenting with UTI at Ayub Teaching Hospital, Abbottabad. **Methods**: One hundred patients of either sex, ranging from neonatal period to fifteen years of age were studied at the Pediatric units of Ayub Teaching Hospital, Abbottabad. Urine colony count and culture were done on the suspected cases. **Result:** Urinary tract infection was common among females, except in the neonatal period. Escherichia coli was the most common organism isolated (71.0%), followed by Klebsiella (13%), Proteus (11%), Staphylococcus (4%) and Pseudomonas (1%). Proteus was isolated from the males only. **Conclusion:** UTI is a significant problem in the children and requires a large scale study at regular intervals in order to identify organisms from time to time and recommend prompt treatment to reduce UTI related morbidity and mortality in children.

Keywords: Pyelonephritis, Colony count, Urine culture.

INTRODUCTION

Urinary tract can be defined by the presence of significant quantity of bacteria in the urine along with signs and symptoms of infection.[1] Urinary tract infection (UTI) is an important cause of bacteremia due to gram negative organisms. Prompt diagnosis and management of UTI can reduce the incidence of morbidity and life threatening bacteraemia.[2] Approximately 3-5% of the girls and 1% of the boys acquire a UTI. [3] UTI can lead to renal scars and if undiagnosed leads to permanent renal damage causing hypertension or end stage renal disease. The diagnosis of UTI is difficult in the neonatal period because the signs and symptoms are non-specific in this age group. The incidence in the neonates is 0.01-1% and can also be as high as 10% in low birth weight and preterm babies.[4] Every child with a proven UTI deserves investigation after first attack. However care must be taken not to expose the child to excessive investigations.[5] Diagnostic workup should be modified to recognize any condition that leads to stasis of the urine in the bladder. Renal calculi, obstructive uropathy (posterior urethral valves), vesicoureteral reflux, and voiding disorders can lead to urinary stasis and may predispose to the development of recurrent UTI and complications.[6]

The pattern of organisms has so far not been studied at Ayub Teaching Hospital. This study was done to determine the different types of organisms and their respective frequencies causing urinary tract infection in admitted patients at Paediatric units of Ayub Teaching Hospital, Abbottabad in order to improve the management of the patients.

MATERIAL AND METHODS

One Hundred patients of diagnosed urinary tract infection ages 0-15 years admitted in Ayub Teaching Hospital Abbottabad were included in the study using non probability (convenience) sampling technique. A detailed history was taken and complete clinical examination was carried out for each case of urinary tract infection. Every patient had urine microscopy, X-ray of kidneys and urinary bladder, urinary colony count and urine culture investigations. The diagnosis of urinary tract infection was based on microscopic finding of more than 5 white blood cells per high power field on urine microscopy and a colony count of 10^5/ ml of single pathogen. In Neonates the urine was collected through supra pubic approach. In uncooperative and moribund patients the urine was also collected through the supra pubic puncture or urinary catheterization. In infants and older children the urine was collected in urine collecting bag or sterilized container, after washing the genital region with soap and water. Mid stream, clean catch, early morning specimens were collected in a sterilized container. All the antibiotics were discontinued 72 hours before sending the

urine for culture and sensitivity. Urine sample was delivered to the laboratory within 1 hour of collection. In case of delay the urine samples was kept at 4ºC and analyzed within 6 hours of the collection. The urine samples were cultured in 5% sheep blood agar and MacConkey's media. Inoculation was done with the help of a 0.001ml caliber loop. All the sample plates were incubated for 48 hrs at 37ºC in 5-10% carbon dioxide for anaerobic growth. Bacterial identification was done by hand lens and standard biochemical tests. Where multiple growths were obtained the culture was repeated again before accepting the results. The details of each patient were recorded in a proforma.

RESULTS

The results of this study are shown in table-1 and figure-1.

Table-1: Organisms isolated in different age groups expressed in percentages

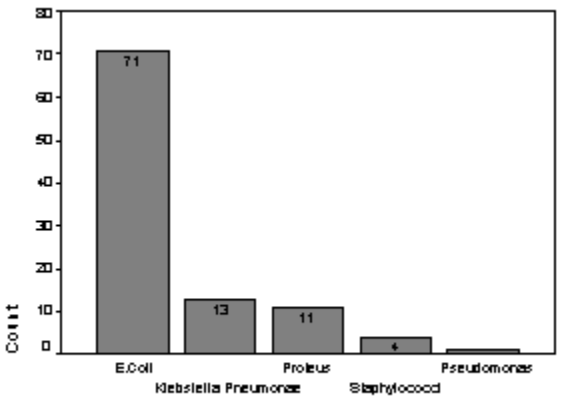
Age Group	Escherichia coli	Klebsiella pneumoniae	Proteus	Staphylococci	Pseudomonas	Total
0-12 months	3 (4.2%)	1 (7.6%)	Nil (0%)	2 (50%)	Nil (0%)	6 (6%)
13-60 months	33 (46.5%)	6 (46.2%)	7 (63.6%)	1 (25%)	Nil (0%)	46 (46%)
61- 120 months	28 (39.4%)	5 (38.6%)	3 (27.3%)	1 (25%)	1 (100%)	39 (39%)
121-180 months	7 (9.9%)	1 (7.6%)	1 (9.1%)	0 (%)	Nil (0%)	9 (9%)
Total	71 (71%)	13 (13%)	11 (11%)	4 (4%)	1 (1%)	100 (100%)

Figure No. 1 Pathogens isolated on urine culture.

DISCUSSION

Most of the infections were observed in the female patients with an overall male to female ratio of 1:2.3. Males out numbered females during the first year of life with a ratio of 1.5:1; this is in full agreement with other studies.[7-11] Female preponderance has been observed after one year of age (3.5:1ratio). Several studies in children above one year of age till fifteen years reported female predominance, with a variable ratio ranging from 6:1 to 1.33:1, depending upon the different sample size, and difference in age groups being studied.[11-15]

Majority of patients (46%) belonged to the 13 to 60 month age group and this coincides with studies from Zaire[12], Turkey[13], United States[15], Australia[16], Kuwait[17], and Iran.[18] This could be because of the reason, as reported by other studies that this age group of 13-60 months is more susceptible to infections due to their toilet training problems.[9] The number of the patients was less in the neonatal period and the cases increased with the increasing age and declined after the thirteen years of age till fifteen years. It is also reported by many studies.[11, 13]



Urine culture result in the patients with diagnosed UTI.

The organisms infecting the urinary tract in this study were E.coli (71%), Klebsiella pneumoniae (13%), Proteus species (11%), Staphylococcus (4%), Pseudomonas (1%) in their descending order of percentages. These results are similar to many latest published articles.[3,14,18] However, a few studies have indicated a lower percentage of E.coli infections and a higher infection with Proteus and Klebsiella species.[4,13,19,20] On the other hand some have given a higher percentage of E.coli infection as compared to other organisms.[16,17] This could be explained on the basis of sampling technique and the gender difference in different studies. Female predominance was observed with an overall ratio of 1:2.3. It was in concordance with other studies.[3-5,13,14,17-22] During the first year of life males were infected more. This was also reported by all other researchers. [3-5,13,14,17-19] Proteus was isolated in the males (11%) only. It was reported in many papers that Proteus mainly affects males with a high incidence in them. In one study from Turkey Proteus was isolated in male patients only.[13] This has been explained on the ability of the Proteus species to swarm the long urethra of the males and ascend to cause the infection. Staphylococcus and Pseudomonas remain the least infecting organisms (4% and 1% respectively). These results are consistent with other studies. The urinary infections caused by Staphylococcus ranged from 0.7% to 8.5% in different studies.[4,13,14,17] Staphylococcus were identified in the neonates and a diabetic patient, where as Pseudomonas was isolated in a cerebral palsy child with marasmus.

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