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Organisms causing Urinary Tract Infection in paediatric patients at Murtala Muhammad Specialist Hospital, Kano, Nigeria

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ABSTRACT: Urinary tract infection (UTI) is common in pediatric practice and important cause of morbidity and mortality in children. Infected urine stimulates an immunological and inflammatory response leading to renal and scarring ultimately leading to end stage renal failure. The present study identified the microorganisms causing urinary tract infection in children presenting with UTI at Murtala Muhammad Specialist Hospital, Kano, Nigeria. **Methods:** fifty patients of either sex ranging from neonatal period of twelve years of age were studied at the pediatric units of Murtala Muhammad specialist Hospital Kan, Nigeria 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 (70.9%). Followed by *Klebsiella* (14%). *Proteus* (10%). *Staphylococcus* (4%) and *Pseudomonas* (2%). *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.

Key words: Pyelonephritis, Colony count, Urine culture

Introduction

Urinary tract can be identified by the presence of significant quantity in the urine along with signs and symptoms of infection¹. 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 or morbidity and life threatening bacteraemia.² approximately 3-5% of the girls and 1% of the boys acquire UTI³. UTI can lead to renal scars and if undiagnosed leads to permanent renal damage causing hypertension or end stage renal disease.

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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 0.0101% and can also be as high as 10% in the low birth weight and preterm babies.⁴ every child with proven UTI deserves investigation.⁵ diagnosis 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 current UTI and complications.⁶

The pattern of organisms has so far not been studied at Murtala Muhammad specialist Hospital, Kano, Nigeria. This study was done to determine the different types of organisms and their respective frequencies causing urinary tract infection in admitted patients at units of Murtala Muhammad Specialist Hospital, Kano, Nigeria in order to improve the management of the patients.

Material and Methods

Fifty patients of diagnosed urinary tract infections ages 0-12 years admitted Muhammad specialist hospital, Kano, Nigeria 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, colony count and urine culture investigations. The diagnosis of urinary tract infection was based on microscopic finding of more than 5 white single in 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 children the urine was collected in urine collected 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 the 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 were kept at 4°C and analyzed within 6 hours of the collection. The urine samples were collected in 5% inoculation was done with the help of a 0.001,ml either loop all the blood agar plates were incubated for 24 hrs at 37°C in 5- 10% carbon dioxide for anaerobic growth and the MacConkey plates were incubated aerobically. Bacteria 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 preformed.

Results and Discussion

The results are presented in Table 1. Most of the infections were observed in the female patients with an overall male to female ratio of 1:2.3 males outnumbered females during the first year of the 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 age 93.5:1 ratio). 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.^{11,13}

Majority of patients (46%) belong to the 13 to 60 month age group and this studies from Zaire¹² and Turkey.¹³ 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 increase with the increasing age and defined after the twelve years of age till twelve years. It is reported by many studies.^{11, 13}

The organisms infecting the urinary tract in this study were (70%). *Klebsiella pneumonia* (14%). *Proteus* species (10.0%). *Staphylococcus* (4%). *Pseudomonas* (2.0%) in their descending order of percentages. These results are similar to many latest published articles.³ However; a few studies have indicated a lower percentage of *E. Coli* infections and a higher infection with *Proteus* and *Klebsiella* species.^{4, 13}

Table 1: Organisms isolated from paediatric patients.

Age Group (Months)	<i>Escherichia coli</i>	<i>Klebsiella</i> spp.	<i>Proteus</i> spp.	Staphylococci	<i>Pseudomonas</i> spp.	Total
0 – 12	1 (2.8%)	1 (4.3%)	Nil(0%)	2 (100%)	Nil (0%)	4 (8%)
13 – 60	17 (48.6%)	3 (42.8%)	3 (60.0%)	Nil (0%)	Nil (0%)	23 (46%)
61 – 120	14 (40.0%)	2 (28.6%)	2 (49.0%)	1 (100%)	1 (100%)	19 (38%)
121 – 144	3 (8.6%)	1 (14.3%)	Nil (0%)	Nil (0%)	Nil (0%)	4 (8%)
Total	36 (70%)	7 (14%)	5 (10.0%)	3 (10%)	1 (2%)	50 (100%)

On the other hand some have given a higher percentage of *E. coli* infection as compared to other organisms¹⁶ this 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 (92% and 1%) respectively). These results are consistent with other studies the urinary infections caused by *Staphylococcus* identified in the neonates and a diabetic patient where as *Pseudomonas* was isolated in a cerebral palsy child with marasmus.

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