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DISTRIBUTION OF ORGANISMS AND PRESENTING ILLNESS IN RELATION WITH CULTURAL POSITIVITY AMONG CHILDREN SUFFERED FROM URINARY TRACT INFECTION

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ABSTRACT

Background: Pediatric patients with UTI may present with nonspecific symptoms such as poor feeding, vomiting, irritability, or fever alone. The causative organisms are mostly bacterial. *E. coli* causes 54-67 percent of all urinary tract infections[4] followed by Klebsiella spp, Proteus spp, Enterococcus and Pseudomonas. The purpose of this study was to evaluate the distribution of organisms and presenting illness in relation with cultural positivity among children suffered from Urinary Tract Infection. **Material & Methods:** The present descriptive, cross-sectional, and prospective study was conducted in the Department of Pediatrics, Dr RPGMC Kangra at Tanda for the period of One year. Total 263 Children aged 1 month to 5 years with fever (axillary temp of >38°C or >100.4°F) without any focus reporting to OPD or admitted to the ward of Pediatric Department were included in the study. **Results:** Majority of the patients had infecting organism as E. coli (81.25%) followed by Klebsiella (12.5%) followed by Proteus (3.1%)and Acinetobacter (3.1%).In culture positive patients all were having fever and majority had presenting illness; burning micturition (36.5%) followed by pain abdomen (21.9%), vomiting (15.6%) and constipation (0.6%). In culture negative patientsalso, all were having fever and majority of patients had constipation (24%) followed by burning micturition (13.4%), vomiting (12.5%) and pain abdomen (10.3%). **Conclusion:** In the present study, majority of the patients of UTI had E. coli as an infecting organism and most of the patients were having fever, burning micturition and pain abdomen as a presenting symptoms.

KEYWORDS: Distribution, Organisms, Presenting Illness, cultural positivity children, Urinary Tract Infection.

INTRODUCTION

The total incidence of febrile illness in pediatric outpatient department practice is 50-55 percent. The incidence wise commonest causes of fever are respiratory causes, gastro-intestinal causes followed by urinary tract infection. Incidence of UTI varies with age of the child. Urinary tract infections are the highest in children during the first 2 years of life. The incidence is much less in older children. Pediatric patients with UTI may present with nonspecific symptoms such as poor feeding, vomiting, irritability, or fever alone. In neonates, UTI is usually a part of septicemia and presents with fever, vomiting, lethargy, jaundice and seizures. Infants and young children present with recurrent fever, diarrhea, vomiting, abdominal pain and poor weight gain. Older children show fever, dysuria, urgency, frequency and abdominal or flank pain. Adolescents may have symptoms restricted to the lower tract, and fever may not be present.[1,2]

The causative organisms are mostly bacterial. *E. coli* causes 54-67 percent of all urinary tract infections followed by Klebsiella spp, Proteus spp, Enterococcus and Pseudomonas. Other bacterial known causes are Staphylococcus saprophyticus, Group B Streptococcus and less commonly Staphylococcus aureus, Candida spp and Salmonella spp. Proteus mirabilis, Citrobacter and Serratia sppare some other known reported causative organisms. Proteusmirabilis is more common in boys than in girls. Streptococcus agalactiae is relatively more common in newborn infants. In children with anomalies of the urinary tract Streptococcusviridians, Streptococcus agalactiae, staphylococcus aureus, hemophilus influenzae and streptococcus pneumoniae may be responsible.[3-6]

The majority (91 to 96%) of UTI results from the ascent of bacteria from the periurethral area, migrating in a retrograde fashion via the urethra to reach the bladder and potentially the upper urinary tract. The diagnosis of urinary tract infection in children is difficult as clinical presentations are vague and non-specific so high index of suspicion is required to diagnosis the urinary tract infection in children 0-5 year.[5,6]

The purpose of this study was to evaluate the distribution of organisms and presenting illness in relation with cultural positivity among children suffered from Urinary Tract Infection.

AIM AND OBJECTIVES

To evaluate the distribution of organisms and presenting illness in relation with cultural positivity among children suffered from Urinary Tract Infection.

MATERIALS AND METHODS

Place of study: Department of Pediatrics, Dr RPGMC Kangra at Tanda

Study design: Descriptive, cross-sectional, and prospective study

Duration of study: One year

Inclusion criteria: Children aged 1 month to 5 years with fever (axillary temp of >38°C or >100.4°F) without any focus reported to Pediatric OPD or admitted in ward of Pediatric Department were screened for eligibility.

Exclusion criteria

- Other known causes of fever.
- Previous history of Urinary tract infection.
- Children received antibiotics prior to presentation.
- Children with other major comorbidities defined as neuromuscular conditions such as spina bifida, previous urologic surgery other than circumcision and immunodeficiency.
- Children on immunosuppressive drugs.
- Children with severe congenital anomalies of urinary tract making it difficult for urine sample collection such as ectopia vesicae and hypospadias.

Urinary tract infection was defined as the growth of a single colony/organism of at least 10^5/mL. Urine samples were obtained by suprapubic aspiration, cathetrisaton and for infants and children not yet toilet trained. In older children mid-stream urine samples were collected. Dipstick urinalysis were performed using rapid diagnostic dipstick (urocolour strips) for Urinary tract infection.

Microscopy was done using the manually counting chamber. Cut-off value for microscopy was taken as significant if >5 pus cells per HPF. The collected samples were sent for the culture immediately. The cultures were read after 24-48 h of incubation at 37°C.[66] Positive urine culture was defined as at least 10^5 colony forming units (CFU) per mL of a single uropathogen. Mixed growths were excluded. The results of dipstick urinalysis, microscopy was compared.

Ethical considerations

Before starting the study, permission from institutional ethical committee was taken. Parents were educated regarding possibility of underlying Urinary tract infection and the importance of detecting it. Thereafter, informed written consent was taken and the importance to carry out further investigations in children depending on their age group was explained to the parents.

Data Collection and Variables

For urine analysis, sample of urine was collected in a sterile container. The sample was processed within an hour of collection. Sample from container was transferred to centrifuge tube and spun at 1500 revolutions per minute (rpm) for 5 min. Supernatant was discarded and sediment was taken. Slide was first seen with ×10 objective and then on ×40 objective microscope piece for detection of leukocytes. More than 5 leukocytes/high power field were considered significant. Urine culture was considered the gold standard test for the diagnosis of Urinary tract infection. Children with urine culture positive were treated with appropriate antibiotics and further radiological evaluation was performed.

Data analysis

Data entry was carried out in MS Excel 2013 and all relevant data were analysed using the statistical package for social science version 21.0 (SPSS, Chicago, IL, USA). Continuous variables were expressed as mean ± standard deviation (SD) and categorical variables as count and percentage.

Financial disclosure

No financial burden was placed to the study population.

RESULTS

A total of 263 Children aged 1 month to 5 years with fever (axillary temp of >38°C or >100.4°F) without any focus reporting to OPD or admitted to the ward of Pediatric Department were included inthe study.

Table 1: Total culture positivity.

Culture	Number of observedpatients (263)	Percentage
Positive	32	12.16%
Negative	231	87.83%

Culture negative patients were in the majority (87.8%) compared to culture positive patients(12.1%).

Table 2: Distribution of organisms in culture.

Organism	Number of patients (32)	Percentage
E.coli	26	81.25%
Klebsiella pneumoniae	4	12.5%
Proteus vulgaris	1	3.12%
Acinetobacter baumannii	1	3.12%
Total	32	100%

Majority of the patients had infecting organism as E.coli (81.25%) followed by Klebsiella (12.5%) followed by Proteus & Acinetobacter (3.1%).

Table 3: Distribution of cases according to presenting illness.

Presentingillness	Culture positive (32)		Culture negative (231)	
	Number ofpatients	Percentage	Number ofpatients	Percentage
Fever	32	100%	231	100%
Pain abdomen	7	21.9%	24	10.3%
Vomiting	5	15.6%	29	12.5%
Constipation	13	0.6%	67	24.0%
Burning micturition	12	36.5%	31	13.4%

In culture positive patients majority had presenting illness; burning micturition (36.5%) followed by pain abdomen (21.9%), vomiting (15.6%) & constipation (0.6%).In culture negative patients majority of patients had constipation (24%) followed by burning micturition (13.4%), vomiting (12.5%) & pain abdomen (10.3%).

DISCUSSION

In our study, Majority of the patients had infecting organism as E.coli (81.25%) followed by Klebsiella (12.5%) followed by Proteus & Acinetobacter (3.1%). Mambatta AK et al[7] in their study reported that Of the 635 culture positives, E. coli (62.8%) was the predominant isolate followed by Enterococcus species, Klebsiella species, Candida species and others.

Most paediatric UTIs are caused by Gram negative coliform bacteria arising from faecal flora colonising the perineum, which enter and ascend the urinary tract.[77] Escherichia coli (E.coli) is the most common uropathogen, responsible for approximately 80% of paediatric UTIs.[78] Uropathogenic E.coli strains possess specific properties, such as fimbriae to attach to the uroepithelial cell surface, to allow them to overcome host defences.[8] Other common uropathogens include Klebsiella, Proteus, Enterobacter and Enterococcus species.[9,10]

In culture positive patients majority had presenting illness; burning micturition (36.5%) followed by pain abdomen (21.9%), vomiting (15.6%) & constipation (0.6%). In culture negative patients majority of patients had constipation (24%) followed by burning micturition (13.4%), vomiting (12.5%) & pain abdomen (10.3%).

The symptoms of UTI usually remain nonspecific throughout infancy. Unexplained fever is the most common during the first two years of life. In fact, it may be the only presenting symptom of UTI in this age group. In general, the prevalence of UTI is greater in infants with temperatures ≥ 39°C than those with temperatures < 39°C. Other nonspecific manifestations include irritability, poor feeding, anorexia, vomiting, recurrent abdominalpain, and failure to thrive. Specific symptoms and signs include increased or decreased number of wet diapers, malodorous urine, and discomfort with urination. A weak or dripping urinary stream suggests a neurogenic bladder or obstruction in the low urinary tract such as posterior urethral valves in boys. Constant dripping of urine or wetting of diapers may suggest the presence of an ectopic ureter, a predisposing factor to UTI.

CONCLUSION

In the present study, majority of the patients of UTI had E. coli as an infecting organism and most of the patients were having fever , burning micturition and pain abdomen as a presenting symptoms. Management of UTI in children can be challenging because symptoms can be vague and nonspecific in young children. A high index of suspicion is essential. UTI should be considered in any child < 5 years presenting with fever. Under-diagnosis and delayed treatment may lead to recurrence and risk for renal scarring which may lead to hypertension and chronic renal failure. Timely and accurate diagnosis and appropriate treatment are therefore essential.

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