

**SOCIO-DEMOGRAPHIC CHARACTERISTICS OF CHILDREN HAVING AGE BETWEEN 1 MONTH TO 5 YEARS AND SUFFERED FROM URINARY TRACT INFECTION**Ankaj Sharma<sup>1</sup>, Poonam Chouhan<sup>2\*</sup>, Ranbir Singh Jaswal<sup>3</sup>, S. C. Jaryal<sup>4</sup>, Ajay Sharma<sup>5</sup> and Gunjan Sharma<sup>6</sup><sup>1</sup>Post Graduate Student Department of Pediatrics, Dr. Rajendra Prasad Government Medical College, Kangra at Tanda.<sup>2</sup>Post Graduate Student Department of OBG, IGMC Shimla.<sup>3</sup>Professor Department of Pediatrics, Dr.R.P.G.M.C., Tanda.<sup>4</sup>Professor & Head Department of Microbiology, Dr. RPGMC, Kangra At Tanda.<sup>5</sup>Assistant Professor, Department of Pediatrics, Dr. RPGMC, Kangra At Tanda.<sup>6</sup>Post Graduate Student, Department of ophthalmology, PGIMER Chandigarh.**\*Corresponding Author: Dr. Poonam Chouhan**

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**ABSTRACT**

**Background:** Urinary tract infection (UTI) is one of the most common pediatric infections causing fever without focus. The purpose of this study was to describe the socio-demographic characteristics of children having age between 1 month to 5 years and 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:** In the present study, out of total majority of the patients were in the age group of 1-3 years (42.9%) followed by <1 year (40.3%) and 3-5 years (16.7%). Majority the patients were males (54.7%) followed by females (45.2%). Culture negative patients were in the majority (87.8%) compared to culture positive patients (12.1%). Incidence of UTI was maximum in the age group of <1 years (15.09%) followed by 1-3 years (11.5%) and 3-5 years (9.09%). In males maximum incidence was in the age group <1 years (16.7%) followed by 1-3 years (11.7%) and 3-5 years (10%). In females the maximum incidence of UTI was in the age group <1 years (13.5%) followed by 1-3 years (11.3%) and 3-5 years (7.1%). **Conclusion:** In present study the incidence of UTI reveals to be 12.1% in age group between 1 month to 5 years. In both males and females maximum incidence of UTI of was in the age group <1 years. 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 and UTI should be considered in any child < 5 years presenting with fever.

**KEYWORDS:** Socio-demographic Characteristics, Children, Urinary Tract Infection.**INTRODUCTION**

Fever is one of the most common presenting symptoms of pediatric illnesses in health care settings. Fever in children under age five years signifies systemic inflammation, typically in response to a viral, bacterial, parasitic, or less commonly, a noninfectious etiology. It may herald the onset of a serious and life-threatening disease, or it may be the sole manifestation of a mild self-limiting viral infection. It is thus difficult to localize the exact diagnosis when fever is without any focus. 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.<sup>[1,2]</sup>

Urinary tract infection (UTI) is one of the most common pediatric infections causing fever without focus. UTI is defined as growth of a significant number of organisms of a single species in the urine, in the presence of symptoms. The gold standard for diagnosis of UTI is positive urine culture. If the culture grows 10 CFU/ml in midstream sample of normally cultured urine or there is a growth of even single pathogen in suprapubic sample or catheterized sample showing >50000 CFU/ml. Recurrent UTI, defined as the recurrence of symptoms with significant bacteriuria in patients who have recovered clinically following treatment, is common in girls.<sup>[3]</sup>

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. In the first year of life, especially in the first three months, UTI is seen more commonly in boys (3.7%) than in girls (2%). Thereafter, the UTI has been reported to be among 3% girls and 1.1 per cent boys.<sup>[4,5]</sup>

The purpose of this study was to describe the socio-demographic characteristics of children having age between 1 month to 5 years and suffered from Urinary Tract Infection.

### AIM AND OBJECTIVES

To describe the socio-demographic characteristics of children having age between 1 month to 5 years and 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  $>38^{\circ}\text{C}$  or  $>100.4^{\circ}\text{F}$ ) 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  $10^5/\text{mL}$ . Urine samples were obtained by suprapubic aspiration, catheterisation 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  $37^{\circ}\text{C}$ .<sup>66</sup> 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  $\times 10$  objective and then on  $\times 40$  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  $\pm$  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  $>38^{\circ}\text{C}$  or  $>100.4^{\circ}\text{F}$ ) without any focus reporting to OPD or admitted to the ward of Pediatric Department were included in the study.

**Table 1: Age and Gender distribution.**

Variables	Number of observed patients	Percentage
<b>Age Group</b>		
<1 Years	106	40.30%
1-3 Years	113	42.96%
3-5 Years	44	16.73%
<b>Sex</b>		
Male	144	54.7%

Female	119	45.24%
Total	263	100%

In the present study, majority of the patients were in the age group of 1-3 years (42.9%) followed by <1 year (40.3%) & 3.1-5 years (16.7%). In the present study,

majority the patients were males (54.7%) followed by females (45.2%).

**Table 2: Sex distribution in different age groups.**

Age Group	Males		Females	
	Number of observed patients	Percentage	Number of observed patients	Percentage
<1 Years	54	37.5%	52	43.69%
1-3 Years	60	41.66%	53	44.53%
3-5 Years	30	20.83%	14	11.76%
Total	144	100%	119	100%

In the present study, majority of males patients were in the age group of 1-3 years (41.6%) followed by <1 year (37.5%) & 3.1-5 years (20.8%). Majority of females

were in the age group of 1-3 years (44.5%) followed by <1 year (43.6%) & 3.1-5 years (11.7%).

**Table 3: Total culture.**

Culture	Number of observed patients (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 4: Incidence of UTI In Various Age Groups According To Positive Culture.**

Age Group	All patients			Males			Females		
	Number of patient	Culture positive	Incidence	Number of patients	Culture positive	Incidence	Number of patients	Culture positive	Incidence
<1 Years	106	16	15.09%	54	9	16.7%	52	7	13.5%
1-3 Years	113	12	10.6%	60	7	11.7%	53	5	9.4%
3-5 Years	44	4	9.09%	30	3	10%	14	1	7.1%

Incidence of UTI was maximum in the age group of <1 years (15.09%) followed by 1-3 years (10.6%) & 3-5 years (9.09%). In males maximum incidence was in the age group <1 years (16.7%) followed by 1-3 years (10.6%) & 3-5 years (10%). In females the maximum incidence of UTI was in the age group <1 years (13.5%) followed by 1-3 years (10.6%) & 3.1-5 years (7.1%).

## DISCUSSION

Urinary tract infections (UTIs) are a common and potentially serious bacterial infection of childhood. History and examination findings can be non-specific, so a urine sample is required to diagnose UTI. Sample collection in young children can be challenging. Bedside dipstick tests are useful for screening, but urine culture is required for diagnostic confirmation.<sup>[6]</sup>

Urinary Tract Infection (UTI) is one of the most common bacterial infections in childhood. The infection may affect the upper urinary tract (referred to as pyelonephritis) or the lower urinary tract (referred to as cystitis). It may be difficult, if not impossible, to distinguish pyelonephritis from cystitis based on clinical symptoms and signs,

especially in infants and young children. From a practical point of view, these two conditions are discussed together under the umbrella of UTI. The high incidence, tendency to relapse, associated morbidity, and problems with the collection of uncontaminated urine specimen present significant challenges to the clinician. UTI is a significant concern for children, parents, and clinicians alike. Prompt diagnosis and appropriate treatment are very important to reduce the morbidity associated with this condition. Thus, the purpose of this study was to describe the socio-demographic characteristics of children having age between 1 month to 5 years and suffered from Urinary Tract Infection.<sup>[7-13]</sup>

In the present study, majority of the patients were in the age group of 1-3 years (42.9%) followed by <1 year (40.3%) & 3.1-5 years (16.7%). In the study done by Nibhanipudi KV *et al*<sup>[4]</sup>; majority of the patients were in the age group 4 months to 12 Months (40) 12 to 24 Months (22) 24 to 36 Months (10) 36 to 48 Months (0) 48 to 72 Months (8). The only urine analysis abnormality noted was positive leukocyte esterase in 2 out of 80 patients.

In the present study, majority the patients were males (54.7%) followed by females (45.2%). Similar to our study in the study done by Nibhanipudi KV *et al*<sup>14</sup> majority of the patients were males. In the present study, majority of males patients were in the age group of 1-3 years (41.6%) followed by <1 year (37.5%) & 3.1-5 years (20.8%). Majority of females were in the age group of 1-3 years (44.5%) followed by <1 year (43.6%) & 3.1-5 years (11.7%).

During the first year of life, the incidence of UTI is approximately 0.7% in girls and 2.7% in uncircumcised boys. In febrile infants, in the first two months of life, the incidence of UTI is approximately 5% in girls and 20% in uncircumcised boys. During the first 6 months, uncircumcised boys have a 10 to 12-fold increased risk of developing UTI. In the neonatal period, UTI is more common in premature infants than term infants. After one year of age, girls are much more likely than boys to develop UTI. UTI has a bimodal age of onset with one peak in the first year of life and another peak at between 2 and 4 years of age which corresponds to the age of toilet training. It has been estimated that approximately 7.8% of girls and 1.7% of boys by the age of 7 years will have had a UTI.<sup>[15]</sup>

Culture negative patients were in the majority (87.8%) compared to culture positive patients (12.1%). Incidence of UTI was maximum in the age group of <1 years (15.09%), followed by 1-3 years (11.5%) & 3.1-5 years (9.09%). In males, maximum incidence was in the age group <1 years (16.7%) followed by 1-3 years (11.7%) & 3.1-5 years (10%). In females, the maximum incidence of UTI was in the age group <1 years (13.5%) followed by 1-3 years (11.3%) & 3.1-5 years (7.1%).

Fallahzadeh MH *et al*<sup>[16]</sup> estimated the prevalence rate of urinary tract infections in preschool children and had reported a prevalence of 4.4%. Lin DS *et al*<sup>[17]</sup> had reported a prevalence rate of urinary tract infection as 13.6% in febrile infants younger than 8 weeks age. Andrew Dziewit J *et al*<sup>[18]</sup> had studied febrile infants less than 8 weeks and had reported a prevalence of urinary tract infection as 4.2%.

## CONCLUSION

In present study the incidence of UTI reveals to be 12.1% in age group between 1 month to 5 years. In both males and females maximum incidence of UTI of was in the age group <1 years. 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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