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ORIGINAL RESEARCH ARTICLE

PREVALENCE OF URINARY TRACT INFECTION AT KANTI CHILDREN'S HOSPITAL

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ABSTRACT

Present study was carried out among the children (0-14 yrs of age) for 10 month time period and isolation of organism causing UTI to them. Urine samplers were collected from 205 children attending in Kanti children's hospital at Maharajung with the aim to isolate the organism causing UTI in children and to correlate bacteriuria, pyuria and clinical feature during the infection. This study also aimed to determine antibiotic sensitivity test profiles of these organisms. Two hundred five urine samples were cultured with the standard bacteriological techniques. Out of 205 urine specimens 28% showed significant bacterial growth. Among the total isolate E.Coli was the predominant isolate (57%), followed by klebsiella pneumoniae (24%) & proteus sps (10%). Greater prevalence of bacteriuria was at age of 0-1 years in male whereas 5-10 years in female children. Growth positivity with regards to gender wise distribution of the urine samples, female children showed higher rate of growth positivity than male children. In vitro susceptibility test of these pathogen showed that almost all isolates were sensitive to nitrofurantoin (88%), followed by Ciprofloxacin (60%), Cotrimoxazole and Amoxycillin were least effective antibiotics against these bacterial isolates.

Keywords: *Children, Urinary tract infection.*

INTRODUCTION

Urinary tract infection simply means the presence of bacteria undergoing multiplication in urine within the urinary drainage system. Infection may be expressed predominantly at a single site of the kidney (pyelonephritis), bladder (cystitis), prostate (prostatitis), urethra (urethritis) etc. In 1958, Kass gave a definition of true or significant bacteriuria by which means that a 100000 or more single species bacteria per/ ml counts in a carefully collected samples of clean voided or mid stream urine made possible a clear distinction between infection and contamination. This number indicates a multiplication of the organism in urinary tract. Multiple strains however have been found to cause UTI in patients with indwelling urethral catheters.

In many parts of our country the facilities for culture and sensitivity is lacking which causes further diagnostic difficulty. The growing kidney might be scared and child may die from its complications. Virtually, we do not know common organisms causing UTI among children and antibiotics sensitivity test profile of these organisms. To my knowledge, no systematic study so far has been done in this field in Nepal. Therefore, this study was alone with the following objectives:

1. To observe the pattern of UTI in children attending in Kanti Children's Hospital.
2. To determine prevalence of organisms causing UTI among the children.
3. To determine antibiotic sensitivity test profile of the organisms causing UTI among children.

MATERIALS AND METHODOLOGY

Sample collection:

For the purpose of this study, the midstream or catheterization specimen urine samples were collected from 205 children patient suspected of UTI, attended in Kanti Children's Hospital (KCM), Kathmandu. All patients were below 14 years of age.

Urine sample were collected in a sterile plastic cup or bottle, who had clinical feature of urinary tract infection.

Processing of the samples:

The collected samples were subjected for routine investigation, culture and antibiotic sensitivity test. During the course of processing of sample, first of all culturing of specimen was done to avoid risk of contamination. For this urine was inoculated in Mac Conkey agar plate and blood agar plate by standard quadrant streaking technique. The number of colonies forming unit (CFU) was multiplied by

1000 to determine the number of microorganism per millilitre in the original specimen. Reincubations of plates were done while no growth or tiny colonies for an additional 24 hours because antimicrobial treatment or other factors may inhibit initial growth, before discarding the plates. With the use of standard microbiological technique, identification of bacterial pathogen was done, which included the colonial morphology, Gram rxn, catalase, oxidase test, biochemical properties and serology if necessary.

RESULTS

Out of 205 urine samples collected 58(28%) sample yielded significant bacteriuria, 68 (33%) sample had Negative growth whereas 27(13%) sample had mixed growth and 52 (25%) sample showed not significant growth (Table1).

Table 1: Patterns of Cultural Results

SN	Growth	Frequency	%
1.	Positive	58	28
2.	Negative	68	33
3.	Mixed	27	13
4.	Non Significant	52	25

Between the two genders, higher percentage of growth was obtained from female children compared to male children.

Table 2: Gender wise pattern of culture report

S.N	Sex	Growth +ve		Growth –ve		Non Significant		Mixed Growth	
		No.	%	No.	%	No.	%	No.	%
1.	Female	30	52	39	57	30	58	17	63
2.	Male	28	48	29	43	22	42	10	37
	Total	58	100	68	100	52	100	27	100

Among the total isolates, E. Coli was predominant (57%) followed by Klebsiella pneumoniae (24%). In case of growth +ve bacterial isolates staph. aureus and streptococcus faecalis were the only isolates in the urine sample.

Table 3: Antibiotic susceptibility pattern against bacteria isolated from urine sample

Antibiotics Used	Sensitivity		Intermediate		Resistant Total		Total
	Number	%	Number	%	Number	%	
Norfloxacin	27	46	2	3	27	46	56
Ampicillin	0	0	-	-	52	90	52
Ciprofloxacin	47	81	3	5	7	12	57
Nalidixic acid	40	69	-	-	18	31	58
Nitrofurantoin	51	88	1	2	8	14	60
Cotrimoxazole	16	27	-	-	39	67	55
Amoxycillin	8	14	1	2	31	88	60
Cephalaxin	19	33	4	7	37	64	60
Chloramphenical	35	60	-	-	23	40	58

The most effective antibiotic was Ciprofloxacin (86%) and Nalidixic acid (71%). Cotrimoxazole was found to be less effective drug (21%). For the bacterial isolates the most effective antibiotic was Nitrofurantoin (87.9%), followed by ciprofloxacin (81%) and Chloromphenical(60.3%) etc.

Table 4: Pattern of different species of the pathogens isolated from infected urine

S.N.	Isolated bacteria	Male	Female	Total
1	E.Coli	10	23	33
2	Klebsiella pneumoniae	5	9	14
3	Proteus mirabilis	4	0	4
4	Proteus Vulgaris	2	0	2
5	Pseudomonas Aeuroginosa	1	0	1
6	Salmonella Typhimurium	0	1	1
7	Shigella boydii	0	1	1
8	Streptococcus faecalis	1	0	1
9	Staphylococcus aureus	0	1	1
	Total	23	35	58

Present study showed the predominant organism causing UTI was E.Coli in both sex in admitted and out patients which accounted (57%) followed by Klebsiella pneumoniae (24%), proteus sps (10%) respectively (Table no.4). Such a high prevalence of isolation in this study was similar to many other studies done on UTI by various other investigators. In a study done by Umran - K in Saudi Arabia found that the organisms predominantly grown on culture were E.Coli followed by Klebsiella pneumoniae.29 Gh Hashemi in Iran carried out a study on "Recurrent urinary tract infection" found that the predominant was E.Coli (78.8%) followed by Klebsiella pneumoniae (18.8%). 9 Similarly such a high rate of isolated E.Coli and Klebsiella pneumoniae were seen in a previous study by Dr. Pushpa Raj Sharma et al on "Urinary infection" of 100 children patients of age group of 4 days to 14 years. The higher percentage of organisms isolated were E.Coli (48%) followed by Klebsiella Pneumoniae (19%), proteus (19%) etc at Kanti Children's Hospital.

Table 5: Microscopic finding of Pus calls on High power Field(Hpf)

S.N.	WBC on HPF	No. of Specimens	Percentage
1	0	121	59
2	1-5	33	16
3	6-10	6	3
4	11-15	9	4
5	16-20	12	6
6	21-25	14	3
7	Plenty	10	9
	Total	205	100

Table 5 gives an idea about the relationship between the infection and pus cells. The present study also shows that as the number of pus cells increased, the significant pathogenic growth also increased. During the study the child with sign and symptoms of UTI sometimes produced sample of urine that show pus cells but not yield a significant growth of bacteria on routine culture. The explanation may be that the patient has been taking antibiotic prescribed on a previous occasion. This finding is similar to the study carried out by Collins L.F. Clark and RW Maskell et al [5].

The predominance of female was observed in the present study. This observation is also in agreement with other reports. This finding is similar to the study done by RHR white found that the prevalence of bacteriuria among school girls is 1 to 2 %. It is only 0.03 % in boys of same age [32].

Present study showed that based in vitro sensitivity test, all isolates way moderately sensitive to the common first line drugs used in UTI, in our set up namely Cotrimoxazole and Ampicillin. But, exhibited good sensitivity to Nitrofurantoin, Ciprofloxacin and Nalidixic acid. Therefore these are the first drug of choice of UTI in children. This finding is similar to the study done by Umran K in Saudi Arabia [29].

DISCUSSION

In the present study found that the prevalence of UTI during childhood is less common than the later adult life. In a study done by Jha and Yadav in Dhankuta, Nepal, found that among 204 urine samples tested from various group of patients including man and woman both 53.43% of urine samples gave positive result.[13] Another studies done by Sagarika Manandhar in TUTH found 38.2 % culture report positive among 280 urine samples.[19] In case of adult use of spermicidal could be also contributory factor for enhancement of encourage the growth of enterobacterial organism. Using of diaphragms for contraceptive of the vagina often invaded by enterobacterial organisms rather than the normal flora.

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