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Research Article

**URINARY TRACT INFECTION AND ITS SENSITIVITY TO
ANTIBIOTICS IN ACUTE CHILDHOOD DIARRHEA****Dr. Amina Pervaiz¹, Dr. Shezana Kosar², Dr. Sumaira Mushtaque³**¹ Medical Officer, BHU DESA Paghwati District Poonch AJK² Medical Officer, Rahma hospital Khuiratta³ Medical Officer, Sheikh Zaid bin Nihan Hospital (CMH) Rawalakot**Article Received:** May 2020**Accepted:** June 2020**Published:** July 2020**Abstract:**

Introduction: Diarrhea is the cause of nearly 18% of all child deaths. In early childhood, the symptoms of diarrhea can be similar to a urinary tract infection (UTI). The purpose of this study was to determine the incidence of UTIs and antibiotic susceptibility in children hospitalized with acute diarrhea.

Place and Duration: In the Pediatric department of District Headquarter Hospital, Bagh for one-year duration from April 2019 to March 2020.

Methods: All cases of acute diarrhea aged 1-60 months and hospitalized. They were included if diarrhea persisted 3 times a day and antibiotics had not been used in the last two days. The sensitivity and resistance of the cultures to common antibiotics was assessed.

Results: Of all 575 patients, 31 (5.4%; 18 males ≈ 58%, 13 females ≈ 42%) had a UTI. There was no gender difference ($p = 0.012$), but 77.4% of the subjects were under 12 months of age ($p = 0.012$; OR = 2.89). The urine culture results were as follows: 27 cases (87.1%), *Escherichia coli*; two (6.5%), *Enterococcus*; one (3.2%), *Pseudomonas*; and one entity (3.2%), *Klebsiella*. Susceptibility to antibiotics was found to be 93.5% to nitrofurantoin and 61.3% to ceftriaxone and nalidixic acid. They were 67.7% resistant to co-trimoxazole and 64.5% to gentamicin.

Conclusion: Although UTIs are not as common in acute childhood diarrhea, this should be taken into account especially in infancy.

Key words: urinary tract infection (UTI), acute diarrhea, antibiotic sensitivity, antibiotic resistance, children

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INTRODUCTION:

Annually, nearly 1.8 million child deaths are reported from diarrheal diseases. According to WHO reports, more than 700 million episodes of diarrhea occur in children under the age of 5. in developing countries¹⁻². Urinary tract infection (UTI) occurs in 3-5% of girls and 1% of boys and is a relatively common problem in childhood. However, a UTI looks like an ordinary disease: it has several important aspects: 1) the clinical signs are non-specific and sound similar to other common childhood diseases; 2) it may be caused by functional or structural abnormalities of the urinary system; 3) in case of delay in diagnosis or treatment, it may cause serious complications, such as renal scarring, renal failure, hypertension; 4) especially in infants there is no specific symptom and it may go unrecognized; 5) early diagnosis and treatment as well as proper management prevent complications. Diarrhea is a common symptom of UTIs in early childhood³⁻⁴. How long does it take to check episodes of diarrhea to find a possible UTI? As diarrhea is a common disease in developing countries, finding a link between UTIs and diarrhea, as research in this case is limited, will be clinically meaningful⁵⁻⁶. This study was conducted to establish the prevalence of UTIs and their susceptibility to antibiotics in hospitalized children with acute diarrhea.

MATERIALS AND METHODS:

It is a retrospective study and the data was taken from the hospital's archives in from April 2019 to March 2020 in the Pediatric department of District Headquarter Hospital, Bagh. They were included if patients aged 1-60 months had diarrhea > 3 times a day and maintained 10⁵ CFU / ml from midstream or bag sampling, > 10⁴ from catheter sampling, and > 10³ from supra-pubic aspiration [9] and antibiotic susceptibility and resistance were measured by the diffusion method. The sample size of 575 people was calculated on the basis of the results of previous studies [10, 11] using the formula $[n = Z^2 \cdot 1 - \alpha / 2 \times p (1 - p) / d^2]$, where we included $\alpha = 0.05$, $p = 0.1$, and $d = 0.02$. Data was analyzed using SPSS 18.0 for Windows (SPSS Inc., Chicago, IL, USA). The Chi-square test and the t test were used to perform the statistical analysis. The p value <0.05 was considered statistically significant.

RESULTS:

A total number of 575 patients (343≈60% male, 232≈40% female) were included; thirty-one (5.4%) were found to have UTI among whom eighteen (58%) were male and thirteen (42%) were female, and 76% were less than 12 months (Table 1).

Table 1 Frequency of urinary tract infection (UTI) in childhood acute diarrhoea by age

UTI	2-6 mo	6-12 mo	>12 mo	Total
Positive	142 (26.1)	153 (28.1)	249 (45.8)	544 (100)
Negative	11 (35.5)	13 (41.9)	7 (22.6)	31 (100)
Total	153 (26.6)	166 (28.9)	256 (44.5)	575 (100)

Numbers in parenthesis show percentage

Pathogens found in positive cultures are reported in Table 2.

Table 2 Pathogens of urinary tract infection (UTI) in childhood acute diarrhoea

Organism	Number	Percent
<i>E. coli</i>	27	87.1
<i>Enterococcus</i>	2	6.5
<i>Pseudomonas</i>	1	3.2
<i>Klebsiella</i>	1	3.2

Antibiotic sensitivity and resistance are presented in Table 3. Frequency of UTI was not different by gender ($P=0.853$), but a significant difference was found for age ($P=0.012$) so that 77.4% of the UTI subjects were <12 months of age (OR=2.89)

Table 3 Susceptibility and resistance to antibiotics, for organisms responsible for urinary tract infection (UTI) in childhood acute diarrhoea

Antibiotic	Resistance	Sensitivity
Ceftriaxone	38.7	61.3
Nalidixic acid	38.7	61.3
Nitrofurantoin	6.5	93.5
Gentamicin	64.5	35.5
Co-trimoxazole	67.7	32.3

DISCUSSION:

Of the 575 study participants, 31 (5.4%) had 18 patients (58%) with male urinary tract infections and 13. Of the 575 study participants, 31 (5.4%) had a UTI, of which 18 (58%) were male and 13 (42%) are women. In various studies, the incidence of UTIs in patients with diarrhea ranges from 5.4% to 11.76%. Our literature review found research by Fallahzadeh and Ghane⁷ with 6.7%, Pryles, 7%, Thakar 8%, Cardone Gabriella Richard 8.5% and Srivaths 11.76%, but our result was similar to that reported by Dharnidharka (5.4%)⁸⁻¹⁰. In the Srivaths study, no statistical differences were found in the number of UTIs in the study group due to gender; however, most studies by Fallahzadeh found more UTIs in girls. A study by Pryles reported up to 100% infection in girls¹¹⁻¹². In our study, 77.4% of patients with UTI were less than 12 months old ($p = 0.012$). Similar age preference was found in the studies by Fallahzadeh and Ghane, Pryles and Thakar by 87.5%, 66.6% and 85.7%, respectively. Interestingly, 100% of UTIs found in Srivaths and colleagues' patients were less than 10 months old. In terms of organism type, the most frequently observed organism isolated from urine cultures was *E. coli* (87.1%), which was similar to Shaw and Fallahzadeh's studies with almost 90%¹³⁻¹⁴. A similar advantage, with less frequency, was found in the studies of Thakar and Dharnidharka by 71.4% and 58.7%, respectively. In this study, *Klebsiella* was isolated from 3.2% of samples, which is less than in the Thakar study (29.6%) and the Dharnidharka study 14.3% [16]. *Pseudomonas* was also isolated from 3.2% of the samples, less than Fallahzadeh (12.5%). As can be seen from most studies, *E. coli* is the most common organism that generates UTIs. The organisms' resistance to ceftriaxone and gentamicin was 38.7% and 64.5%, respectively. Interestingly, this was similar to the Valavi survey conducted in our region, which showed 27.4% and 64.8% respectively¹⁵. This similarity increases the credibility of the two studies mentioned above. The limitations of this study were as follows: antibiotic resistance was assessed by the disc diffusion method in this study, while the use of a minimum inhibitory concentration (MIC) may produce results that are more accurate; incomplete records of some patients may affect outcomes; and studies with more patients may produce more accurate results.

CONCLUSION:

This study found UTI in 5.4% of the subjects with acute diarrhea, mostly less than 12 months of age and resistant to ceftriaxone, the commonest used antibiotic. According to the association of UTI and diarrhea, especially if the patients are febrile and younger than one year, ruling out urinary tract infection and attention to the state of antibiotic resistance are of particular importance. Finally, a

case-control study might determine UTI risk factors in children with acute diarrhea to perform an appropriate urinary tract culture and treatment

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