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FREQUENCY OF UTI IN CHILDREN PRESENTING WITH DIARRHEA

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Abstract

Background: *The second most common bacterial cause of diarrhea in infants and children is urinary tract infection (UTI). The estimated incidence of urinary tract infections in children is 3–10% for female and 1-3% for male. Renal parenchymal damage and renal scarring are permanent consequences of Urinary tract infection that can lead to hypertension and progressive renal impairment.*

Objective: *The aim of this study was to appraise the incidence of Urinary tract infection in children presenting diarrhea.*

Materials and Methods: *This cross-sectional study was conducted by women and children hospital karak for six months duration from July 2024 to December 2024. A total of 140 patients, both male and female, ranging in age from 7 months to 5 years, were included in the study. Children older than five, those with a history of using antibiotics within 48 hours, and those without approval were not allowed to participate in this study. Urinary catheterization was used to investigate the urine culture. All of the patients' indications and symptoms were recorded, and urine was sent to a reputable lab for culture. SPSS 24.0 was used to analyze all of the data.*

Results: *The study included 140 cases of diarrhea that were admitted to the pediatric ward. Out of 140 patients 95 (67.8%) were male patients and 45 (32.1%) were female. Age of 35 (25%) patients were from 7 months to 1 years, 60 (42.1%) had ages between 2 to 3 years and 45 (32.1%) were from 4 to 5 years. Furthermore, 45 (32.1%) patients experienced mild diarrhea, 65 (46.6%) had moderate diarrhea, and 30 (21.4%) had severe diarrhea. Of the 140 patients, Urinary tract infection (UTI) was not observed in 90 (64.2%) patients while 50 (35.7%) patients were observed with UTI. E.Coli (25 cases) and Enterococcus (15 cases) were the most frequently isolated organisms from urine, followed by Klebseilla (7 cases) and citrobacter (3 cases).*

Conclusion: *For infants and children, diarrhea is the most prevalent problem. It is linked to a higher rate of morbidity and mortality in children older than three years. It is concluded that children who arrive with diarrhea had a higher prevalence of urinary tract infections. In this study E.coli was the most prevalent pathogen followed by Enterococus. When a child has diarrhea, a urine analysis and culture are necessary to confirm a urinary tract infection and avoid long-term consequences such hypertension and renal parenchymal damage.*

INTRODUCTION

The second most common bacterial cause of diarrhea in infants and children is urinary tract infection (UTI) [1]. Diarrhea may be an initial sign of UTI in younger children [2, 3]. In pediatrics, urinary tract infection (UTI) is still the single most typical cause of febrile sickness [4]. UTI is the most frequent bacterial illness in infancy [5,6]. The estimated incidence of urinary tract infections in children is 3–10% for females and 1-3% for males. Renal parenchymal damage and renal scarring are permanent consequences of UTIs that can lead to hypertension and progressive renal impairment [7, 8]. Diarrhea may be linked to UTIs because the majority of the organisms that cause UTIs are colonic in origin and infections can be asymptomatic [9,10]. The second most frequent bacterial infection in children and newborns is acute diarrhea. Diarrhea can be identified as infectious or noninfectious by diagnostic algorithms. Microorganisms directly infecting the gastrointestinal system is the cause of infectious diarrhea. Diarrhea usually doesn't receive much attention in patients with infectious illnesses that affect other organ systems or are systemic in nature rather than predominantly affecting the gastrointestinal tract [11]. In both sexes, but particularly in boys, the first UTI usually happens in the first year of life and mostly affects the upper urinary tract[12]. Although many infants with UTI have gastrointestinal symptoms such as poor feeding, vomiting, abdominal pain, and diarrhea, diarrhea can also predispose infants and young children to develop UTI [13,14]. This is because very young children may exhibit nonspecific signs and vague symptoms that go unnoticed, making it impossible to obtain accurate data on the incidence and prevalence of UTIs. Children who are younger and have a UTI may have lower abdomen pain, small-volume voids, urgency, hesitation, or dysuria. Unspecific symptoms like fever, irritability, jaundice, vomiting, diarrhea, or failure to thrive are more frequently seen in infants with UTIs. Urine with an odd smell is not a good indicator of a UTI [15]. Younger children with UTIs may manifest with diarrhea [16]. It is often suggested to use transurethral catheterization or suprapubic aspiration when collecting urine from newborns and young children. An adequate urine sample is more likely to be obtained via urethral catheterization than by aspiration [17]. One of the main causes of acute diarrhea in infants and children is rotavirus [18,19]. Male are more susceptible to UTIs than female in the early years of life. According to reports, the incidence of UTI was 5% in girls and 20% in males who had not had circumcision [20]. Conversely, girls are more likely to experience the effects later in life. Between the ages of two and four, the incidence is 1.9 percent for boys and 8.1% for girls. After the first year, however, females are more likely to experience symptomatic UTIs [21]. Although diarrhea is one of the most prevalent infant illnesses in our nation, there is little information on the link between UTI and diarrhea. This study was carried out to determine the prevalence of UTI in infants and young children who experienced diarrhea.

Materials and Methods

This cross-sectional study was conducted by women and children hospital karak for six months duration from July 2024 to December 2024. A total of 140 patients, both male and female, ranging in age from 7 months to 5 years, were included in the study. After obtaining parents' or guardians' written agreement, comprehensive demographic information was reviewed and documented, including age, sex, place of residence, severity, and full medical history. Children older than five, those with a history of using antibiotics within 48 hours, and those without approval were not allowed to participate in this study. Urinary catheterization was used to investigate the urine culture. All of the patients' indications and symptoms were recorded, and urine was sent to a reputable lab for culture. Growth of more than 10^5 colonies of a single urinary tract pathogen/ml of the material in a midstream of urine was considered a positive urine culture [22]. Standardized methods were used to handle the patients. SPSS 24.0 was used to analyze all of the data. The mean ± SD was found.

Results

The study included 140 cases of diarrhea that were admitted to the pediatric ward. Of the 140 patients, Urinary tract infection (UTI) was not observed in 90 (64.2%) patients while 50 (35.7%) patients were observed with UTI. (Table 1). Out of 140 patients 95 (67.8%) were male patients and 45 (32.1%) were female (Table 2). Age of 35 (25%) patients were from 7 months to 1 years, 60 (42.1%) had ages between 2 to 3 years and 45 (32.1%) were from 4 to 5 years (Table 3). Furthermore, 45 (32.1%) patients experienced mild diarrhea, 65 (46.6%) had moderate diarrhea, and 30 (21.4%) had severe diarrhea (Table 3). Besides , 80 patients (57.1%) lived in cities, whereas 60 patients (42.8%) lived in rural areas (Table 3). E. Coli (25 cases) and Enterococcus (15 cases) were the most frequently isolated organisms from urine, followed by klebseilla (7 cases) and citrobacter (3 cases) (Table 4). Of the 50 children with UTIs, 36 were adequately hydrated, and 14 displayed some signs of dehydration. A statistically significant correlation was found between some dehydration and UTI (Table 5).

Table 1: Frequency of UTI in children with diarrhea.

Urine culture	Frequency	Percentage (%)
Positive	50	(35.7%)
Negative	90	(64.2%)
Total	140	(100%)

Table 2; Gender distribution of UTI

Gender	Urine culture results		
	Positive	Negative	Total
Male	40 (42.1%)	55 (57.8%)	95 (67.8%)
Female	10 (22.2%)	35 (77.7%)	45 (32.1%)
Total	50 (35.71)	90 (64.2%)	140 (100%)

Table 3: Demographics of all the included children

Characteristics		Frequency	percentage %
Age Groups	7m-1 year	35	(25%)
	2-3 years	60	(42.1%)
	4-5 years	45	(32.1%)
Residence	Urban	80	(57.1%)
	Rural	60	(42.8%)
Severity	Mild	45	(32.1%)
	Moderate	65	(46.6%)
	Severe	30	(21.4%)

Table 4; Frequency of UTI Causing Bacteria

Organisms	Frequency	Percentages
E.coli	25	(50%)
Enterococcus	15	(30%)

Klebseilla	7	(14%)
Citrobacter	3	(8%)

Table 5: Dehydration status and UTI in the research group

Dehydration	Urine Culture Results		
	Positive	Negative	Total
Normal	36	14	50
a few	10	30	40
Severe	4	46	50
Total	50	90	140

Discussion

Infections can range in severity from minor symptoms to potentially catastrophic systemic illnesses. In the current study, 35.7% of children who presented with diarrhea had a UTI overall. Urinary tract symptoms were not recorded in any of these UTI patients. The symptoms of a UTI are more complicated in younger children. There is no clear explanation for the correlation between UTI and acute diarrhea; it could be caused by an ascending infection or by a urinary tract infection that resembles the parenteral diarrhea associated with various diseases. In contrast to research by Thakar et al., Balat et al., Srivaths et al., Narayanappa et al., Fallahzadeh et al., Bagga and al., Jeena et al., and Dharindhar et al., which ranged from 7% to 24%, we found a 35.7% prevalence of UTI.[23,24] In this study, 140 children with diarrhea had their UTIs confirmed by culture. There were 45 (32.1%) female patients and 95 (67.8%) male patients. Of the patients, 35 (25%) were between the ages of 7 months and 1 year, 60 (42.1%) were between the ages of 2 and 3 years, and 45 (32.1%) were between the ages of 4 and 5 years. These findings were similar to some earlier research where the majority of children were younger than one year old and male children made up over 60% of the total [25–26]. In the current study, we discovered that 30 (21.4%) patients had severe diarrhea, 65 (46.6%) had moderate diarrhea, and 45 (32.1%) had mild diarrhea. According to a research by Saeedi F et al. [27], 13.3% of children had moderate diarrhea, 40.7% had mild diarrhea, and 46.7% had moderate diarrhea. 50 (35.71%) of the patients in our study had a culture-proven UTI, whereas 90 (64.2%) did not. Out of 200 patients with diarrhea, 15 (7.5%) had a UTI, according to Saeedi F et al. [27]. In the current study, UTIs were most frequently observed in the 2–3 year age group (n = 20), followed by the 7–1 year age group (n = 19). The two together account for (n=39) 78% of all UTI cases (n=50). Similar findings are found in other studies. The most prevalent age groups in the Thakar et al. study were 6 to 12 months (75%) and 12 to 24 months (12.5%), which combined made up 87.5% of the sample.3. This suggests that UTI symptoms are more nebulous in younger age groups. E. Coli was the most frequent cause of UTIs in the current study (n = 25), followed by Enterococus (n = 15). This was consistent with Srivaths et al. and Uppal et al. [28,29,30]. Both sexes typically generate a substantial periurethral colonization with aerobic bacteria after birth. E. Coli and Enterococci colonization decreases during the first year of life and typically lightens around age five. According to research by Stamey et al., extensive *E. coli* colonization of the periurethral region and the lower urethra precedes and is linked to the ascending route of urinary tract infection. Gastroenteritis may raise the likelihood of UTI development and aid in the colonization of periurethral flora [31]. According to Thakar et al.'s study, out of 100 individuals, 35 had dehydration, and 6 of those cases—or roughly 17% of the total—had a UTI. Likewise, among the 140 participants in our study, 56 had dehydration. The current study

shows that the genito-urinary tract is usually unrelated to the nonspecific signs and symptoms of UTI in newborns and young children. 6 of these 50 children had a UTI, which was statistically significant and around 12% of children who were dehydrated. This suggests that it is prudent to screen children who present with diarrhea and dehydration for associated urinary tract infections. In our study, we found that *E. coli* was the most prevalent organism in 25 (50%) patients, then *Enterococcus* in 15 (30%) patients. Many of previous studies showed that E. Coli was the most prevelant organism associated with urinary tract infection [32,33]. To close the knowledge gaps that parents have about identifying the warning indications of acute diarrhea, educational interventions are required. To enhance child health outcomes, it is important to emphasize adherence to suggested procedures, such as preparing oral rehydration salts (ORS) properly and seeking healthcare as soon as possible [34]. UTIs should be identified and treated as soon as possible because they can disrupt kidney development and function in infant and children. The level of caution for UTI should be maintained, and all children who arrive with severe diarrhea should be examined, as diarrhea is one of the symptoms of UTI in children under three years old, and gastroenteritis can also lead to colonization of the periurethral region and ascending infection.

Conclusion

For infants and children, diarrhea is the most prevalent problem. It is linked to a higher rate of morbidity and mortality in children older than three years. It is concluded that children who arrive with diarrhea had a higher prevalence of urinary tract infections. In this study *E.coli* was the most prevalent pathogen followed by *Enterococus*. When a child has diarrhea, a urine analysis and culture are necessary to confirm a urinary tract infection and avoid long-term consequences such hypertension and renal parenchymal damage.

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