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ORIGINAL ARTICLE

Infection of the Urinary Tract and its Prevalence Among Children Presenting with Malnutrition

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ABSTRACT

Background: UTIs are a common cause of acute illness in newborns and young children, affecting 8% of girls and 2% of boys by age seven, with a recurrence rate of 10% to 30%. A UTI is a serious condition that can develop into sepsis and other life-threatening consequences in children

Objective: To assess the frequency of urinary tract infections in malnourished children.

Material and Methods: The study included 241 patients from the Pediatric Department of Children Gajju khan medical collage Swabi. Pakistan. July 7, 2019 – January 7, 2020, All children had urine samples taken by urine bags and catheterization and forwarded to the hospital laboratory to test for UTIs. The same consultant microbiologist with at least five years of expertise supervised all laboratory studies.

Results: As per frequencies and percentages for UTIs, 19 (7.88%) patients had UTIs.

Conclusion: Given the high frequency of UTIs in children with severe malnutrition, additional research utilizing standardized microbiological approaches is essential. To support the treatment recommendations for UTIs in these children, using urine dipsticks and microscopy in conjunction with urine culture is critical.

Keywords: Protein Energy Malnutrition, Bacterial Infection, Urinary Tract Infections.

INTRODUCTION

The incidence of urinary tract infections (UTIs) in newborns and young children is high, with recurrence rates between 10% and 30%.[1] The Canadian Pediatric Society has revised its guidelines for diagnosing UTIs and should be reviewed for sample collection, testing, and treatment strategies [2]. Urinary tract infection (UTI) in young infants generally has vague symptoms, making the collection of a urine sample difficult [3]. A lower than recommended sampling rate means that up to half of primary care children with UTIs may not be detected at initial contact [4]. The research indicated that up to 80% of UTIs go undiagnosed in basic care. Primary care practitioners have been recommended to get a urine sample for culture from sick children [5].

Early childhood nutrition is critical for a child's immune system and physical and mental development [6]. Especially in South-East Asia and Sub-Saharan Africa [7], malnutrition persists in youngsters. Poverty and illiteracy are key contributors to malnutrition in children under five years old [8]. Various anthropometric measures have been used to assess child nutrition. Stunting (age-related height), wasting (weight-related height), and underweight (weight-for-age). However, measuring the MUAC is a simple, rapid, and exact way to diagnose malnutrition in children under five years old. [9].

Malnourished children are more prone to UTIs than their well-nourished peers, and the risk rises with malnutrition. SAM is related to immunological weakness, making afflicted infants more susceptible to serious infections[10,11]. Most studies in impoverished nations found a significant incidence of UTI among hospitalized children with SAM. Recognizing this risk may help doctors make better diagnostic and treatment choices in these children[12,13]. UTI is recorded in 16.5 percent of malnourished children, 6 percent of 13, and 16 percent of 12.

This research aims to investigate the frequency of UTIs in malnourished children[14]. Considering the previous research, it is proposed that the worldwide burden of UTI is increasing and varies greatly amongst populations[15]. Malnourished children have low immunity and are susceptible to clinical and subclinical UTIs. A UTI is a serious condition that may develop into sepsis and other life-threatening consequences in children. Since no studies on this issue have been undertaken in the previous five years, this research will provide us with current information on the frequency of urinary tract infections in malnourished children under five. The study's findings will also be shared with other health professionals and researchers[16].

Sampling Technique: consecutive non-probability sampling

Sample Selection

Inclusion Criteria:

- all children presenting with malnutrition with a duration >6 months and have not used any antibiotics for the last 2 weeks.
- Age: 1 year to 18 years.
- Sex: both male and female.

Exclusion Criteria:

- children with already diagnosed UTI.
- Children with a history of antibiotic intake in the last 48 hours.
- Children with congenital urinary tract abnormalities as diagnosed by medical records and ultrasound examination.

If included, the conditions mentioned above act as confounding factors and will introduce bias in the study results.

Data Collection Procedure: The study comprised individuals admitted to the OPD with malnutrition (as per operational definitions above). The study's goal, risks, and benefits were discussed with all parents, and their informed written permission was acquired. We gathered urine samples from all the kids and submitted them to the hospital lab for testing. The same consultant microbiologist with at least five years of expertise supervised all laboratory studies. Age, gender, malnutrition grade, parent education, and socioeconomic background were all recorded in a predesigned Proforma. Exclusion criteria were rigorously followed to control confounders and bias.

Data Analysis: The mean + standard deviations for continuous variables like age, weight, and height were computed in SPSS 2.4. Gender, malnutrition grade, parent education, socioeconomic level, and UTI were calculated as frequencies and percentages. UTIs were stratified using the chi-square test by age, gender, malnutrition grade, parent education, and socioeconomic level to see influence modifiers. The findings were all tables and graphs.

RESULTS

The study was conducted at MTI-HMC Peshawar's Pediatric Department. Here are the results: -

Age means and S.D.s were 5+2.86, weight means and S.D.s were 18 (5.26 percent). Height means and S.D. were 85+17.64. 181 (75.10%) patients were aged 1-10. 60 (24.89%) patients were aged 11-18. 180 cases (74.68%) were male. Female patients made up 61 (25.31%). 29 (12.03%) individuals had grade I malnutrition, 115 (47.71%) had grade II malnutrition, and 97 (40.24%) had grade III malnutrition. 35 (14.52%) of patients' parents were illiterate. 31 (12.86%) had an elementary education, and 175 (72.61%) had secondary education. 47 patients (19.50%) were from impoverished households, 151 (62.65) from middle-class families, and 43 (17.84%) from wealthy families. UTIs were found in 19 (7.88%) patients. Tables 1, 2, and 3 show UTI stratification by gender, age, malnutrition grade,parental education, and socioeconomic position.

Table-1: STRATIFICATION OF UTI WITH GENDER

AGE	UTI	FREQUENCY	PERCENTAGE	P VALUE
MALE	Yes	14	05.80%	0.916
	No	166	68.87%	
FEMALE	Yes	05	02.07%	
	No	56	23.23%	

Table-2: STRATIFICATION OF UTI WITH AGE (n=241)

AGE	UTI	FREQUENCY	PERCENTAGE	P VALUE
1-10 Years	Yes	12	4.97%	0.209
	No	169	70.12%	
11-18 Years	Yes	07	2.90%	
	No	53	21.99%	

Table-3: STRATIFICATION OF UTI WITH GRADE OF MALNUTRITION (n=241)

GRADES OF MALNUTRITION	UTI	FREQUENCY	PERCENTAGE	P VALUE
I	Yes	02	0.82%	0.251
	No	27	11.20%	
II	Yes	06	2.48%	
	No	109	45.22%	
III	Yes	11	4.56%	
	NO	86	35.68%	

DISCUSSION

Kids' UTIs are common (10 percent -30 percent)[17]. UTI sample collection, testing, and treatment recommendations changed. Collecting urine from UTI infants is difficult. Pediatric UTIs might go undiagnosed for a year. Untreated UTIs are common[18]. Urine cultured from a sick kid The immune system and physical and mental development of a kid are affected by nutrition. Malnutrition is common throughout Southeast Asia and Africa. Inequality harms children. Pediatric anthropometrics (weight-for-age) [19]. The MUAC test may detect malnutrition in infants. Young children who are malnourished are more prone to UTIs SAM makes babies more prone to infection. SAM in underprivileged children. Researchers want to help these youngsters. UTIs occurred in 16.5% (14), 6.5% (13) and 16.5% (14). (14). (14). (12). 7 Pediatric UTI fever 4 It comes third among poor kids, behind G.I. and respiratory issues[20]. Men and children with obstructive uropathy are at risk. These antibodies do not protect against infection. Malnourished kids have more UTIs. Less immune youngsters become ill easier. Worldwide, SAM causes waste and malnutrition. 11-13 or W/H-3. edema SAM with UTI14-21 (hypoglycemia, hypothermia, lethargy, or other symptoms). These youngsters' UTIs are easier to identify and cure.

Many SAM kids have UTIs in Africa, Asia, and Latinos (Table 1) [21]. Gram-negative bacilli isolates are closely related. Antibiotics and urine dipsticks are advised for SAM kids.Injured tissues have less edema and white blood cell migration. It's no surprise SAM youngsters have UTIs. UTIs with secretory IgA.Acute UTI raises sIgA, IgA, and FSC24. sIgA in urine suggests infection25. SIgA urinary in symptomatic women In a similar vein, excluding pets, IgA reactivity was reduced28. These T cells inhibit IgA response29, 30. Protein restriction impairs the immunological system in rats30.Anemia raises blood iron levels[22]. Sepsis and UTI bacteria thrive.A Nigerian hospital study reported an 11% prevalence. 1 in 4 malnourished kids is a boy. Age disparities masked sex disparities. Early infancy and toilet training show a female predominance. Non-potty trained suggested high Escherichia coli. In Niger Republic, 16% of E. coli, K. pneumoniae, Proteus mirabilis, and E. faecalis patients have SAM15[23]. It was not sex.

That's a HALF of UTIs. In SA16, 75 malnourished youngsters. Anatomical anomalies or reflux decrease UTI incidence. Male UTIs (34.7 percent). Kwashiorkor caused 19 UTIs (7.88 percent). In men, circumcision may go unrecognized. E. coli14 governed Nigeria. Under-five malnourished children had 26.1% UTI. 68 Negroid children hospitalized for kwashiorkor had UTI. E. coli UTIs in the Suprapubic Area.

Infected children with retroviruses are prevalent in SA. 19 HIV/AIDS and UTIs in Children: No Link31. Infants with HIV had normal kidney function and ontogeny[24]. The procedure is uncommon. Indian uncircumcised had it32.90 poor Ethiopian kids had UTIs. 19 UTIs were studied (7.88 percent). The study comprised 44 (49%) juvenile marasmus patients (32 percent). (17%) Bacteria in the gut caused it. Maybe sex and circumcision worked. Kids get UTIs.UTI23: (Middle East). They discovered a 30% UTI rate. mumps. They were not malnourished. SAM youngsters needed more UTIs.Children under 5 have bacteriuria in India. Fever and diarrhea bacteriuria with or without hunger (P0.01). 286.6% Fever malnutrition (5.7 percent). Malnourished kids experienced more UTIs. 7 88 severely malnourished children were investigated for urine incontinence[25]. 7 Gram-negative enteric bacteria and UTIs were found in impoverished Tanzanian children under 5 (7.88 percent). (Ethiopia) Kenyan researchers detected 7 MRSA UTIs (leukocyte esterase and nitrite) after 2 years (24 percent). ELEGANS In one study, 15% of 140 SAM kids developed bacteriuria. 19 UTIs were studied (7.88 percent). Tinea Tonsillitis Compared to Bangladesh, our study detected 19 (7.88%) UTIs among 100 impoverished youngsters. 7 Gram-negative bacteria have a consistent etiology. Others looked at malnutrition and UTIs7,14,17. Sickness and diarrhea upped it by 7 points. A similar incidence of malnutrition exists in both countries. Consensus trial14,17 It might be a research design.SAM in children requires frequent antibiotics even if mild (UTI12).

SAM8 has 3 RCTs, 5 Cochrane reviews, and 37 observations. In testing, amoxicillin outperformed oxazole.Norms, research, and policy SAM-free Diagnose or treat UTI [26]. Complex SAM needs urine dipsticks Hemolysin and nitrite in urine, But not leukocyte esterase. >10106 unc., >5106 c. Fever and renal T.B. (sterile pyuria). • Antibiotics or UTI tests Unanimously approved global concept (National Institute for Health and Care Excellence [NICE]). If a serious disease is suspected, start antibiotics and culture urine. No UTI? Take no antibiotics. This includes SAM UTI youngsters. SAM is treated with ampicillin and gentamicin. A 48-hour urine test after intravenous antibiotics 22 Local resistance patterns affect regular urine tests. Primary and secondary care should be less interdependent33. This may be challenging in underdeveloped countries. Ignore bacterial diseases. Aside from penicillin, 6 months to 5 years22 Damage to the renal parenchyma and infection need further study. Evaluate each youngster. Money and research. But structural issues require ultrasonography. Offer dimethylsulfoxide and cystourethrogram scanners. Recurrent UTIs might be caused by immunological issues[27].

CONCLUSION

Given the high frequency of UTIs in children with severe malnutrition, additional research utilizing standardized microbiological approaches is essential. To improve the evidence for treatment guidance for UTIs in these children, urine dipsticks and microscopy

performance should be compared to urine culture (the gold standard).

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