



URINARY TRACT INFECTION PREVALENCE IN MALNOURISHED CHILDREN, AGED 6 MONTHS TO 5 YEARS, IN A TERTIARY CARE CENTER

Paediatrics

Dr. Kolla Mahitha Krishna*

Final Year PG , Pediatrics, Gems *Corresponding Author

Dr. V. Ravi Kumar Associate Professor, Pediatrics, Gems

ABSTRACT

Introduction: The urinary tract is a common site of infection in children and it is defined as a colonization by a pathogen occurring anywhere in the urinary tract: kidney, ureter, bladder and urethra.1Malnutrition is major health problem in developing countries of the world. In malnourished children, skin and mucosa do not offer effective physical barriers against infections due to impaired immunity leads to high risk of infections, so leads to high mortality in developing or under developed countries.4 Malnutrition increases the chances urinary tract infection and vice versa.3Aim of the study is to evaluate and find out the prevalence of urinary tract infection in malnourished children between 6 months to 5 year and to find out the causing organism and antibiotic sensitivity pattern . **Method:** A total of 50 malnourished children were listed and clean catch midstream urine sample was collected for urine culture, according to WHO criteria of malnutrition. Children with urinary tract abnormality were excluded from the study. **Result:** Total of 44 cases was present after exclusion. Out of total 44 children, 14(30.4%) were symptomatic and 30(68.6%) children were asymptomatic . E. coli is the commonest organism causing UTI 8 (59.5%). Other organism are Klebsiella1(14.6%), Proteus mirabilis 1(13.3%), and Pseudomonas 1 (12.6%). The order of antimicrobial sensitivity pattern was amikacin (100%)> ceftriaxone (80.4%)> cefotaxime (15%). Other common drugs have developed resistance to these organisms. **Conclusion:** Our findings suggest that malnourished children who have unexplained fevers are more susceptible to UTI .In order to diagnose and treat the bacterial infection , urine analysis and culture tests must be performed in all malnourished children.

KEYWORDS

urinary tract infection, malnutrition , antibiotic spectrum , urine culture , children

INTRODUCTION

The urinary tract is a common site of infection in children and it is defined as a colonization by a pathogen occurring anywhere in the urinary tract: kidney, ureter, bladder and urethra¹. Unexplained fever and failure to thrive are the most common symptoms in infants, where as increased frequency of micturition , burning sensation or cry during micturition ,enuresis ,loin pain, abdominal pain, suprapubic pain are seen in older children and some children remain asymptomatic². urinary tract infection can be leading to pyelonephritis and chronic kidney disease . Early diagnosis of UTI is very helpful for starting early treatment which is helpful for the child's improvement. In malnutrition, Because of low immunity, children are more vulnerable to infections. Malnutrition increases the chances urinary tract infection and vice versa³. Failure to thrive is caused by UTI and malnourishment. Socioeconomic factors and environmental factors causing under nutrition are the neglect of girl child, large family size, lack of child spacing and family welfare method like unplanned maternity, standard of living ,child rearing practice , sanitation. Malnutrition is major health problem in developing countries of the world. In malnourished children, skin and mucosa do not offer effective physical barriers against infections and impaired cell mediated immunity leads to high risk of infections, so leads to high mortality in developing or under developed countries⁴.

AIMS AND OBJECTIVES

To evaluate and find out the prevalence of urinary tract infection in malnourished children between 6mon to 5 years and to find out the causing organism and antibiotic sensitivity pattern.

MATERIALS AND METHODS

The Descriptive study was undertaken at GEMS hospital between January 2022 to June 2022 after obtaining clearance from Hospital Ethical Committee.The urine samples were collected in both MAM and SAM, irrespective of symptoms whether symptomatic or asymptomatic. In the study, mid-stream urine was collected in the age group of children 6 month to 5 years. Midstream urine method is used in children who were toilet trained and finger tap method is used in children who were not trained to use the toilet . Collected urine samples had been sent for rapid test and urine culture and sensitivity.Data was entered in excel sheet. Statistical analysis was done using statistical software SPSS. Qualitative variables were expressed as proportion and quantitative variables. Outcomes were expressed in proportions.

Inclusion Criteria

- Age 6 month –5 years

- Both boys and girls
- Both MAM and SAM according to WHO criteria.
- Both symptomatic & asymptomatic cases

Exclusion Criteria

Children having

- Any congenital anomalies in G.U.T
- Obstructive uropathy & renal problems.
- Pts on steroids.
- Immunodeficiency disorder HIV infection

RESULT & OBSERVATION

Table 1: Demographic And Clinical Characteristics Of Study Participants (n=44).

Characteristics		Number (N)	Percentage (%)
Age in months	6-12	10	22.4
	13-24	16	36.8
	25-36	9	21.3
	37-48	6	13.8
	49-60	2.5	5.7
Sex	Boys	22	50
	Girls	22	50
	MAM	23	54.0
	SAM	22	46
Symptoms			
Nutritional	Fever	12	28.7
Status	Urinary symptoms	3	8
	Diarrhoea	4	5.7
	Vomiting	2	3.4
Symptoms of UTI	Symptomatic	14	30.4
	Asymptomatic	30	68.6

Table 2: Frequency of organism in urine culture positive children (n=8).

Organisms	Number (N)	Percentage (%)
E. coli	5	59.5
Klebsiella	1	14.6
Proteus	1	13.3
Pseudomonas	1	12.6

DISCUSSION

This study was done in Department of Pediatrics Great Eastern Medical College, Ragolu , Srikakulam, Andhra Pradesh. This study investigated 50 malnourished children in the age group of 6 months to 60 months. 6 children were excluded from the study because of known

case of renal anomalies. In total of 44 malnourished children, majority of the children were <2 years. Out of this, 13-24 months of the age children were common. In the study, male and female were present equally about 50% each. There is no gender preponderance. In this study, prevalence of the bacterial infection was 16.6%. The prevalence was almost similar to study by Rabasa et al, which is about 11.3%. While other studies showed varying prevalence about 8% to 37%⁸. In this study there was ,14 children were symptomatic (30.4%) while 30 children were asymptomatic (68.6%) and that difference was statistically significant ($p < 0.01$).

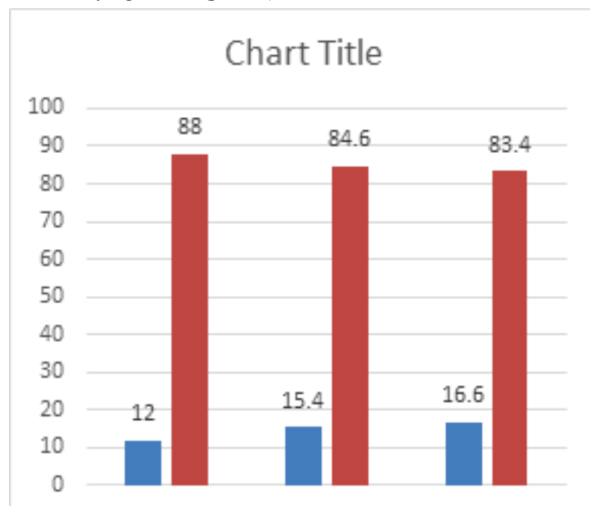


Fig 1. urine examination

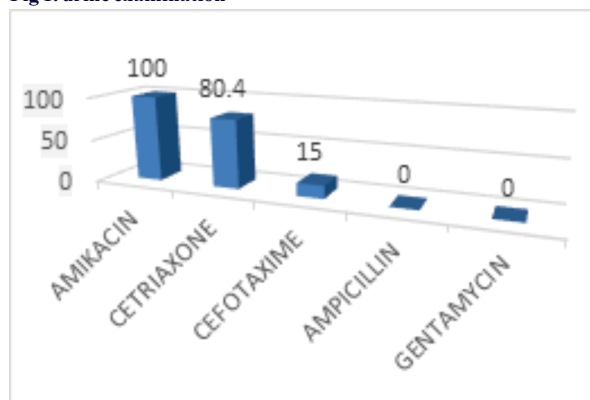


Fig 2. Antimicrobial sensitivity pattern to the organism

The commonest organism causing UTI in malnourished children was *E. coli* in about 8 (59.5%) cases. Similar reports were evidenced in previous studies.^{5,6} Fever was the most common clinical presentation observed in the study (59.3%). This was similar to the study of Robino et al.⁹ Pyuria was present in 7 children, out of 44. Of 7 cases, 6 children were having bacteriuria. In 8 UTI children, 5(66.7%) children were having pyuria and remaining children were not having bacteriuria 3(33.3%). This explains that malnourished children may not have pyuria in addition to the symptoms. In previous studies, pyuria was about 38.8%.⁷

CONCLUSION

The study findings support the conclusion that children who are malnourished have a greater prevalence rate of UTI and most common bacterial organism isolated in urine culture is *E. coli*. Amikacin, ceftriaxone, cefotaxime are the most sensitive antimicrobials against these organisms and resistant to ampicillin and gentamycin. Based on these observations the diagnostic and therapeutic guidelines currently in use for clinicians managing children with complicated MAM and SAM.

REFERENCES

1. Steven L, Chang MD, Linda D. Shortliffe MD pediatric urinary tract infections. *Pediatr Clin N Am*. 2006;53:379-4
2. Williams GJ, Wei L, Lee A, Craig JC. Long-term antibiotics for preventing Recurrent urinary tract infection in children. *Cochrane Database Syst Rev*. 2006;(3):CD001534.
3. Baggia A, Tripathi P, Jatana V, Hari P, Kapil A, Srivastava RN, et al. Bacteriuria and urinary tract infections in malnourished children. *Pediatr Nephrol*. 2003;18(4):366-70

4. Bourke CD, Berkley JA, Prendergast AJ. Immune Dysfunction as a Cause and Consequence of Malnutrition. *Trends Immunol*. 2016;37(6):386-98. doi:10.1016/j.it.2016.04.003.
5. Page AL, de Rekeneire N, Sayadi S, Aberrane S, Janssens AC, Rieux C, et al. Infections in children admitted with complicated severe acute malnutrition in Niger. *PloS one*. 2013;8(7):e68699.
6. Berkowitz FE. Infections in children with severe protein-energy malnutrition. *Ann Trop Paediatr*. 1983;3(2):79-83.
7. Caksen H, Cesur Y, Üner A, Arslan S, Sar S, Celebi V, et al. Urinary tract infection and antibiotic susceptibility in malnourished children. *Int J Urol Nephrol*. 2000;32(2):245-7
8. Uwaezuoke SN. The prevalence of urinary tract infection in children with severe acute malnutrition: a narrative review. *Pediatric Health Med Ther*. 2016;7:121-7.
9. Robino L, Scavone P, Araujo L, Algorta G, Zunino P, Pérez MC, et al. Intracellular bacteria in the pathogenesis of *Escherichia coli* urinary tract infection in children. *Clin Infect Dis*. 2014;59(11):158-64.