

PREVALENCE OF URINARY TRACT INFECTION IN SEVERELY MALNOURISHED PRESCHOOL CHILDREN

C.R. Banapurmath
S. Jayamony

ABSTRACT

Eighty eight severely malnourished preschool children (Grade III or Grade IV, IAP classification) were studied to find out the prevalence of urinary tract infection (UTI). Fifty three well nourished preschool children served as controls. Urine samples were collected by suprapubic aspiration in children below 3 years and in older children a clean catch midstream sample of urine was collected. The urine samples were subjected to direct microscopic examination, Gram's stain and culture. UTI was detected in 7 (8%) of the 88 malnourished children. Besides UTI, the other associated infections included respiratory tract infection (31.8%), diarrhea (27.2%) and tuberculous meningitis (12.7%).

All the children were admitted for different reasons, e.g., respiratory infection, diarrhea, anemia, tuberculous meningitis and the major findings were all related to the obviously affected systems. None had symptoms or signs suggestive of UTI. Thus the urinary tract infection tended to remain hidden. The state of malnutrition may lead to masking of clinical features of UTI. It can, therefore, be said that UTI is an important occult infection in malnourished children and must be specifically looked for in these cases.

Key words: Malnutrition, Urinary tract infection.

Urinary tract infection (UTI) is a major cause of morbidity among children. Unexplained fever and failure to thrive are common presenting signs in infants, besides nausea, vomiting and diarrhea. In slightly older children, in addition to the above, increased frequency of micturition and nocturnal enuresis can be the other associated complaints. Sometimes the infection may remain asymptomatic. There are very few studies on urinary tract infection in malnourished children. In a study carried out by Phillips and Wharton(1) on 75 malnourished children, UTI was detected in 8 (10.7%) children. The present study was carried out in children selected from the pediatric wards of the Chigateri General Hospital to assess the prevalence of UTI in 88 severely malnourished children.

Material and Methods

Eighty eight children aged 1-5 years of age weighing less than 60% of the expected weight for age according to LAP classification(2) were selected from the Pediatric wards of the Chigateri General Hospital during April, 1989 to April, 1990. Fifty three children selected from the Out-patient Department between 1-5 years of age and weighing more than 80% of the expected weight for age were selected as controls.

In children below the age of 3 years, urine was collected by suprapubic aspiration(4). In older children, after cleansing

From the Department of Pediatrics, J.J.M. Medical College, Davangere.

Reprint requests: Dr. C.R. Banapurmath, Professor of Pediatrics, 176, 3rd Main, P.J. Extension, Davangere 577 002, Karnataka.

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the external genitalia with carbol soap solution, and then with sterile water, clean catch midstream sample of urine was collected in autoclaved bottles. The urine samples were transferred to the laboratory and subjected to microscopy and urine culture within half an hour of collection. In addition, routine investigations like microscopic examination, albumin and pH were carried out. Urine culture was considered significant if the colony count was 100,000 or more per ml of freshly voided urine. In case of suprapubic aspiration, any growth obtained was considered to be significant.

Results

Sixty two children (70.5%) had Grade III PEM and 26 children (29.5%) had Grade IV PEM. Of the 88 severely malnourished children, 7 (8.3%) had evidence

of UTI by urine culture. *Table I* gives the clinical details of these 7 children. The urine microscopic examination did not show pyuria except in one case. Bacteria were, however, seen in 4 (57%) cases. In all the 7 cases, there were no symptoms or signs suggestive of UTI. *E.coli* was isolated in 3 children, *Proteus* in 2 and *Enterobacteria* and *Klebsiella* were isolated in one child each. None of the 53 controls had a positive urine culture.

The associated infection and/or disease states present in these 88 children are shown in *Table II*.

Discussion

Not many studies of urinary tract infection in malnourished children have been carried out. An earlier study by Phillips and Wharton(1) in Uganda detected UTI

TABLE I—Clinical and Laboratory Profile of Patients of PEM with Positive Urine Culture

Age in Years	Sex	Diagnosis	Urine microscopy	Culture	Blood		Abdominal ultra-sound
					Urea (mg/dl)	Creatinine	
2	M	Abdominal tuberculosis, Grade III PEM, anemia	Motile bacilli	<i>Proteus</i>	20	0.8	Normal
2	M	Chronic diarrhea, Grade IV PEM, anemia	Non-motile bacilli	<i>E. coli</i>	25	0.9	Normal
2½	F	Anemia, Vitamin A deficiency, acute gastroenteritis, Grade III PEM	2-3 pus cells	<i>E. coli</i>	25	0.9	Normal
3	F	Anemia, Vitamin A deficiency, Grade IV PEM	Normal	<i>Klebsiella</i>	30	0.9	Normal
3	F	Vitamin A deficiency, Grade III PEM, anemia	Granular casts, non-motile bacilli	<i>Enterobacter</i>	17	0.9	Normal
2	F	Anemia, Vitamin A deficiency, Grade III PEM, primary complex	Non-motile bacilli	<i>Proteus</i>	28	0.9	Normal
2	M	Anemia, Grade III PEM, primary complex	Normal	<i>E. coli</i>	32	0.9	Normal

TABLE II—Associated Infections and Problems

Infection	No. of cases	No. with UTI
1. Respiratory infection	28 (31.8%)	2
2. Diarrhea	24 (27.2%)	3
3. Anemia	22 (25%)	2
4. TB Meningitis	11 (12.7%)	-
5. Skeletal tuberculosis	1 (1.1%)	-
6. Chronic suppurative otitis media	1 (1.1%)	-
7. Keratomalacia	1 (1.1%)	-
Total	88 (100%)	7

Figures in parentheses indicate percentages

in 10% of malnourished children. Later studies(5,6) revealed UTI in 26% and 9.5% of malnourished children, respectively. In the present study, 8% of malnourished children had UTI. It was surprising that all the 88 malnourished children studied were admitted in the hospital for various illnesses other than UTI. The most common associated conditions were respiratory infection (31.8%), diarrhea (27.2%) and anemia (25%). Similar infections have been noted by other workers(7,8). Of the 26 children admitted for respiratory infection, two had UTI, Of the 24 children with diarrhea 3 and of the 22 children with anemia 2 had UTI.

An autopsy study carried out by Stirling(9) in 33 severely malnourished children, between 6-18 months of age, revealed renal pathology in 22 (66.7%) and pyelonephritis in 10 (32.2%) infants. He concluded that many children who recover

from malnutrition may have residual renal damage. Dayal *et al.*(5) carried out renal biopsy in 142 malnourished children. Twenty two children had pyelonephritis. Follow up renal biopsy was done in 31 cases. Most of the cases showed regression of glomerular changes and of changes like cloudy swelling of the proximal and distal convoluted tubules. Yet abnormal histopathology did persist in a few cases.

The results obtained from this and earlier studies clearly indicate that UTI is an important occult infection in malnourished children. Urine microscopy as a guide to the presence of UTI is unreliable and significant bacteruria can occur in the absence of pyuria(10). In this study too, urine microscopy by itself was not of much use and culture was necessary to arrive at a diagnosis. It is, therefore, recommended that urine culture should be performed in all significantly malnourished children to diagnose UTI. Further studies are needed to follow up such malnourished children who have associated UTI and also to find out the impact of treatment on the recovery of the malnourished state.

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