

Incidence of UTI, Organisms Isolated From Urine Culture and their Antibiotic Sensitivity in Sam Children Aged between 6-59 MonthsDivya K¹, Aishwarya S², Farheen Taj³, Durgappa H⁴^{1,2,3} Final Year Postgraduate, Department Of Pediatrics, Ballari Medical College And Research Centre, Ballari, Karnataka India⁴Professor, Department Of Pediatrics, Ballari Medical College and Research Centre, Ballari, Karnataka India

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Abstract:**Background:** UTI in SAM prevalence rates ranges from 6% to 37% in developing countries. The prevalence of UTI was significantly higher in malnourished children than in their well-nourished counterparts. Hence this study was planned to determine the incidence of UTI in SAM children, and to identify the causative organisms and their antibiotic sensitivity pattern.**Objectives:** To study the incidence of UTI among SAM children between 6month to 59months, to study the various organism and their culture and sensitivity pattern.**Material and Methods:** It was a hospital based prospective study, conducted in district NRC Ballari, BMCRC. A total of 102 SAM children who fulfilled WHO criteria for SAM were enrolled in the study. Urine microscopy and culture sensitivity were performed. The confirmatory diagnosis of urinary tract infection was made only on the basis of urine culture report. Data was entered into Microsoft excel data sheet and was analyzed using SPS22version software and Epi-info version 7.2.1 (CDC Atlanta) software.**Results:** Of total 102SAM children, incidence of UTI was found to be 15.7%. E-Coli was the most common organism isolated from urine culture (62.5%), followed by staph epidermidis (25%) and klebsiella (12.5%).Most of the organisms isolated were sensitive to amikacin.**Conclusion:** Incidence of UTI in SAM children was 15.7%.Themost common organism isolated was E.coli. Organisms showed varied sensitivity to antibiotics, hence urine culture and sensitivity should be performed in all these children.**Keywords:** Incidence, UTI, Organisms, Urine Culture, Antibiotic Sensitivity, Children.This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

Severe acute malnutrition is a major public health problem in developing countries, it is estimated to contribute up to 45% of all childhood mortality globally, the majority of which are in low and middle income countries. [1]

Children with malnutrition have immunological dysregulation and are thus susceptible to common childhood infections such as infectious diarrhea, pneumonia and bacteremia, urinary tract infections etc. [2,3]

Urinary tract infection (UTI) is one of the most common causes of febrile illness in Children, ranking next to gastrointestinal and respiratory tract infection in developing countries. [4,5] UTI often remain asymptomatic. Hence, high index of suspicion is critical for the early diagnosis and prompt initiation of appropriate therapy. In malnourished children there is reduced cell mediated immunity;

diminished IgA response; reduced levels of complements; decreased efficacy of phagocytes; reduced inflammatory response, and are thus susceptible to common childhood infections. [6,7] There is a synergistic interaction between malnutrition and infection. [8]

The response to infection is impaired or absent in children with malnutrition, so the usual clinical features seen in UTI may not be present in these children. [9] The prevalence of UTI was significantly higher in malnourished children than in their well-nourished counterparts. [10] From the global reports, UTI prevalence rates ranges from as low as 6% to as high as 37% in developing countries. [9]

UTI is an important occult infection in malnourished children and should be specifically looked for in these cases. [11] Hence this study was planned to determine the incidence of UTI in SAM children.

And to identify the causative organisms and their antibiotic sensitivity pattern.

Objectives:

- To study the incidence of urinary tract infection among SAM children between 6 months to 59 months.
- To study the various organism and their culture and sensitivity pattern.

Material and Methods:

This is a hospital based prospective study, conducted in district NRC Ballari, Ballari Medical College and Research Centre, to study the incidence of urinary tract infection among SAM children between 6months to 59 months and the various organism and their culture and sensitivity pattern.

A total of 102 SAM children, who were meeting the WHO criteria for SAM were enrolled in the study. The detailed sociodemographic information including age, gender, socioeconomic status,

clinical features (fever, irritability, failure to gain weight, crying during micturition, suprapubic tenderness) were taken. A thorough physical examination was done in all the children.

Urine sample was collected from the patient by appropriate method. Urine microscopy and culture sensitivity were performed. The confirmatory diagnosis of urinary tract infection was made only on the basis of urine culture report.

Statistical Analysis

Data was entered into Microsoft excel data sheet and was analyzed using SPSS 22 version software and Epi-info version 7.2.1 (CDC Atlanta) software. Categorical data was represented in the form of Frequencies and proportions.

Chi-square test was used as test of significance for qualitative data. Continuous data was represented as mean and standard deviation.

Results:

Table 1: Incidence of UTI among SAM children

UTI	Count		%
	Present	16	15.7%
Absent	86	84.3%	
Total	102	100.0%	

The above table shows, among the 102 SAM children enrolled in the study, the incidence of UTI was found to be 15.7% (16 out of 102), while 84.3% (86 out of 102) were free from UTI.

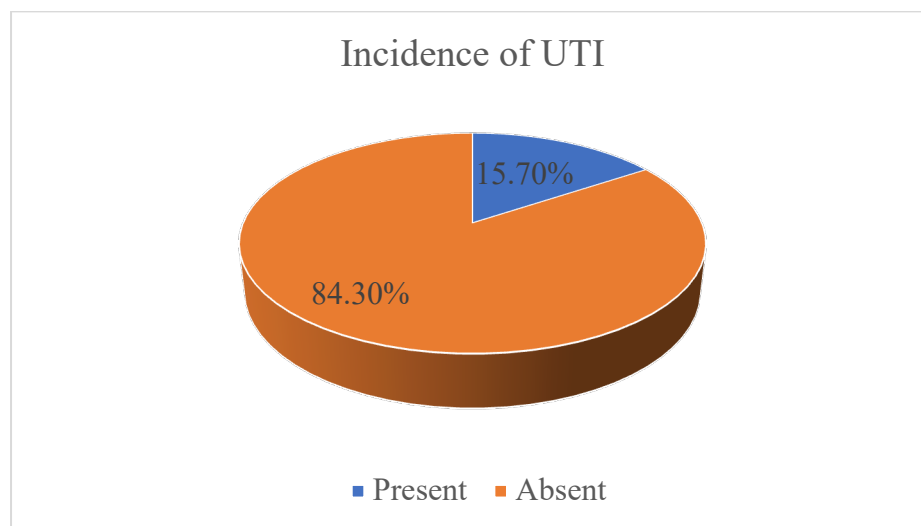


Figure 1: Pie diagram showing Incidence of UTI

Table 2: Organisms isolated in Urine Culture among subjects with UTI

	Yes	
	Count	%
E-coli	10	62.5%
Klebsiella	2	12.5%
Staph epidermidis	4	25.0%
Cons Staph	0	0.0%
Pseudomonas	1	6.2%

In the study, E-Coli was the most common organism isolated from urine culture (62.5%), staph epidermidis isolated in 25%, klebsiella in 12.5%, pseudomonas in 6.2%.

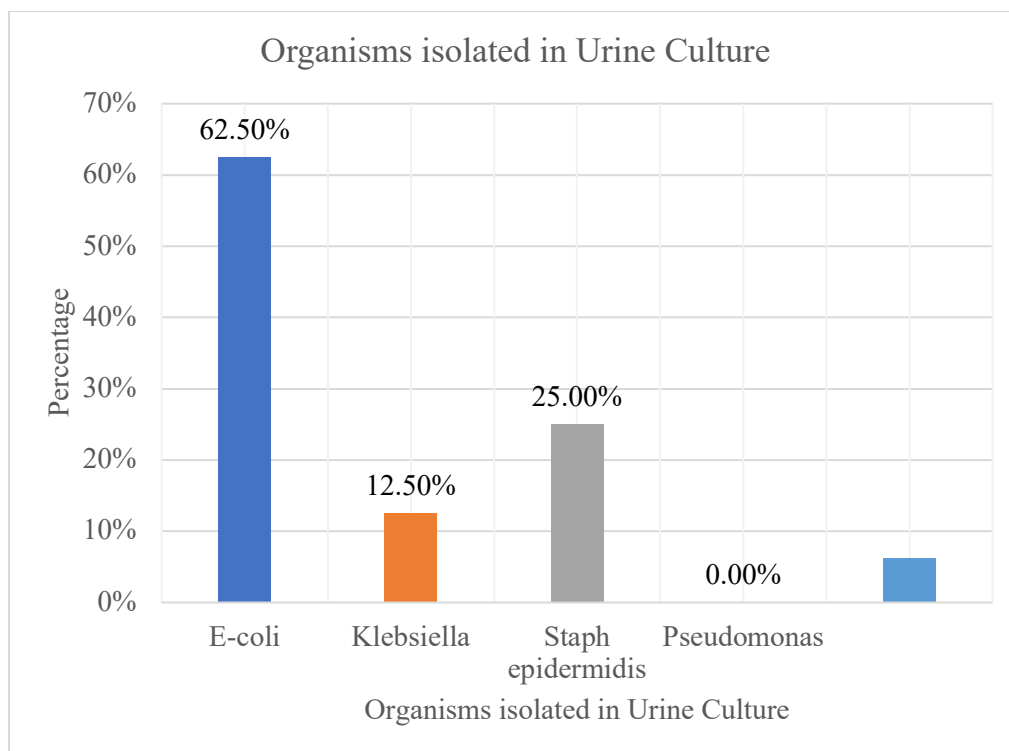


Figure 2: Bar diagram showing Organisms isolated in Urine Culture

Table 3: Antibiotic sensitivity pattern and its association with Organisms isolated in Urine Culture among SAM children with UTI

	E-coli		Klebsiella		Staph epidermidis		Cons Staph		Pseudomonas	
	Count	%	Count	%	Count	%	Count	%	Count	%
Amikacin	8	80.0%	2	100.0%	2	50.0%	0	0.0%	0	0.0%
Nitrofurantoin	4	40.0%	1	50.0%	1	25.0%	0	0.0%	0	0.0%
Azithromycin	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Cefotaxime	3	30.0%	0	0.0%	1	25.0%	0	0.0%	0	0.0%
Ciprofloxacin	1	10.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Doxycycline	3	30.0%	1	50.0%	0	0.0%	0	0.0%	0	0.0%
Tetracycline	0	0.0%	0	0.0%	1	25.0%	0	0.0%	0	0.0%
Norfloxacin	1	10.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Cefpodoxime	1	10.0%	0	0.0%	1	25.0%	0	0.0%	1	100.0%
Amoxyclav	0	0.0%	0	0.0%	1	25.0%	0	0.0%	0	0.0%
Pipzo	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0%
Imipenem	1	10.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Meropenem	1	10.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

The antibiotic sensitivity pattern among organisms isolated in urine culture from subjects with UTI shows varied resistance levels.

E. coli demonstrated the highest sensitivity to Amikacin (80%), followed by moderate sensitivity to Nitrofurantoin (40%), Doxycycline (30%), Cefotaxime (30%), and low sensitivity to Ciprofloxacin, Norfloxacin, Cefpodoxime, Imipenem, and Meropenem (10% each). Klebsiella showed complete sensitivity to Amikacin (100%)

and partial sensitivity to Nitrofurantoin and Doxycycline (50% each). Staph epidermidis exhibited sensitivity to Amikacin (50%) and Cefpodoxime, Amoxyclav, and Tetracycline (25% each).

Cons Staph showed no sensitivity to any antibiotics. Pseudomonas was highly sensitive to Cefpodoxime and Pipzo (100%), but resistant to all other antibiotics tested.

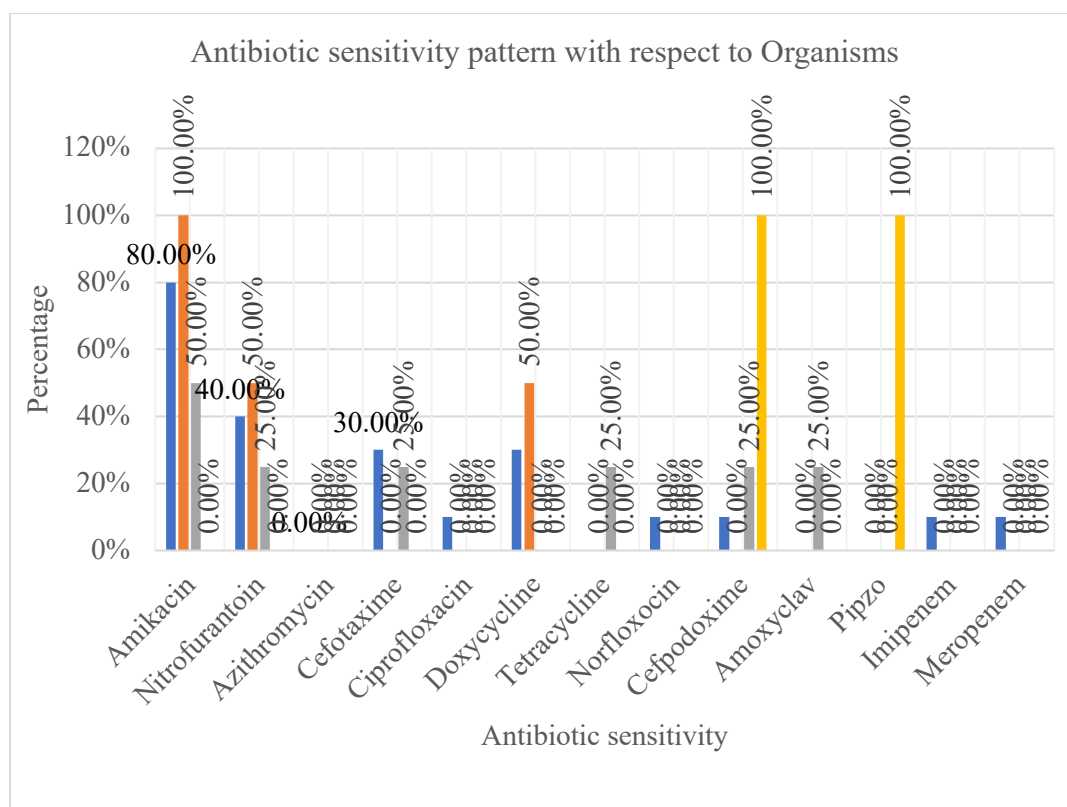


Figure 3: Bar diagram showing Antibiotic sensitivity pattern and its association with Organisms isolated in Urine Culture among SAM children with UTI

Discussion:

Malnutrition in children is an important public health problem, especially in developing countries like India which need much attention to tackle this condition and its comorbidities. Because of impaired immunity, malnourished children are more prone for infection and due to poor immune response these infections remain silent. Urinary tract infection is an important cause of morbidity and mortality in children. Because of the high prevalence of UTI in malnourished children, the disease needs special attention in this subgroup of children. More over the risk of bacteriuria is increase with increasing severity of malnutrition.

This study was a hospital based prospective study carried out in district NRC Ballari, department of pediatrics, BMCRC to determine the prevalence of UTI in SAM children between 6-59 months. A total of 102 SAM children were included in this study.

In our study, the incidence of UTI was found to be 15.7% (16 out of 102) which is similar to study conducted by Bagga et al. [10] in India where the prevalence noted was 15.2%. However the prevalence of UTI in SAM children a study done in south Africa, is high comparable to our study. In a study, C.R. Banapurmath [11] et al. reported 8% prevalence of UTI in children aged 1-5 years of having weight for age <60% which was lower than our study. The differences in the prevalence in var-

ious studies can be due to different type of study and methods of sample collection. Reason behind the increased prevalence of UTI in SAM most probably due to impaired immunity, which renders the child to become more prone for infections compared to their counterparts. In Our study most common organism isolated was E.coli, which is comparable to study done in both India, Africa where gram negative bacteria were the most frequently isolated bacteria. E-coli was the commonest one as studies done in Gambia, Kenya, Tanzania, Turkey, Ethiopia, South Africa.

In a study done by Kumar et al. [13] reported that organisms were 100% sensitive to amikacin, 81.4% to ciprofloxacin and 7% to cefotaxime. Bagga et al. [10] found good sensitivity to cotrimoxazole, amoxicillin, ciprofloxacin and ceftriaxone. In a study by Ibrahim et al. [14] 100% sensitivity was seen to gentamycin and ciprofloxacin. In a study by Sharma et al., [15] E-coli showed 90-100% sensitivity to imipenem, amikacin, nitrofurantoin and gentamycin.

Conclusion:

- Incidence of UTI in SAM children was 15.7%
- The most common organism isolated from urine culture was E.coli.
- Organisms showed varied sensitivity to antibiotics, hence urine culture and sensitivity should be performed in all these children.

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