Brief report

Urinary tract infection and antibiotic susceptibility in malnourished children

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In this study 31 (30%) cases of urinary tract infection (UTI) in 103 children with malnutrition, who were admitted to our hospital, were investigated prospectively to determine the frequency of UTI, organisms causing infection and their antibiotic susceptibility.

The study included 103 children with malnutrition, who were admitted to the Yüzüncü Yil University Department of Paediatrics, between May 1998 and November 1998. Chlidren whose weights according to age were below 90th percentile were considered malnourished. Observing five or more leukocytes on microscopic examination of urine was accepted as pyuria. Growth of more than 10^5 colonies/ml of a single organism in the urine culture was regarded as UTI.

Physical examination, routine blood and urine analyses, and urine culture were performed in all 103 patients. As treatment in cases of UTI antibiotics were given initially according to the clinical and laboratory findings, and later changed as required.

Of the 31 children with UTI, 12 (38.8%) were boys, and the age of the patients ranged from 50 days to 30 months (mean 11.6 months, SD 7.6). Vomiting and diarrhoea (74.1%), fever (32.2%), cough (19.3%), diarrhoea alone (9.6%) and seizure (9.6%) were the main symptoms. Sixteen (51.6%) patients had received antibiotic therapy before admission to the hospital. The patients' weights and heights ranged from 2 to 10 kg (mean 5.9 kg, SD 2.0) and height 53 to 85 cm (mean 67.6, SD 7.8) respectively. Seven patients had mild, 11 had moderate, and 13 had severe malnutrition. There was not a significant difference between UTI and the degree of malnutrition ($p>0.05$).

Pyuria was found in 12 (38.8%) children. Haemoglobin level ranged from 5.3 to 13.9 g/dl (mean 10.6 g. SD 1.2) and anaemia was observed in 10 (32.2%) patients. There was neutrophil leukocytosis in 22 children. The most commonly isolated microorganism was *Escherichia coli*, and the others were *Klebsiella pneumoniae* and *Proteus mirabilis* (Table 1). The cultured bacteria and their antibiotic susceptibilities are presented in Table 2. Strains of *E. coli* were resistant to co-trimoxazole (82.3%), ceftriaxone (17.6%), cefotaxime (17.6%), and ciprofloxacin (17.6%), but none of them were resistant to gentamicin.

Table 1. The cultured bacteria in urine cultures and the number of patients

Bacteria	Number of patients (n:31)	%
Escherichia coli	17	(54.8)
Klebsiella pneumoniae	3	(9.6)
Proteus mirabilis	3	(9.6)
Enterobacter cloacae	2	(6.4)
Klebsiella oxitoca	2	(6.4)
Morganella morganii	1	(3.2)
Citrobacter freundii	1	(3.2)
Enterobacter aerogenes	1	(3.2)
Salmonella species	1	(3.2)

Hospitalisation ranged from 24 hours to 17 days (5.12 ± 4.6 SD). None of the patients died.

UTI is a well recognised complication in malnourished children (1). The incidence of symptomatic UTI is 3% and 1.1% in normal healthy girls and boys respectively (2). However, the incidence of UTI in infants with malnutrition is between 8% and 34.7% in various series in the literature (1,3,4,5). The rate was 30% in our study.

We did not find any significant difference between UTI and the degree of malnutrition ($p>0.05$). In most series, as in our study, it was noted that *E. coli* was the organism most commonly isolated from urine cultures in malnourished children (1,5,6).

In most reported studies *E coli* and *Klebsiella* species were sensitive to gentamicin in malnourished children, and resistant to co-trimoxazole.

UTI in infants with malnutrition is common, and should be routinely investigated.

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Table 2. Cultured bacteria and their antibiotic susceptibilities in our patients

Bacteria	Amikacin		Cefazolin		Ceftriaxone		Cefuroxime		Cefotaxime		Ciprofloxacin		Gentamycin		Nitrofurantoin		Co-trimoxazole	
	S	R	S	R	S	R	S	R	S	R	S	R	S	R	S	R	S	R
Escherichia coli	16	1	10	7	14	3	8	9	14	3	14	3	17	0	13	4	3	14
Klebsiella pneumoniae	2	1	1	2	3	0	1	2	3	0	3	0	1	2	0	3	0	3
Proteus mirabilis	2	1	0	3	1	2	1	2	1	2	3	0	3	0	0	3	2	1
Enterobacter cloacae	1	1	0	2	0	2	0	2	0	2	2	0	0	2	1	1	0	2
Klebsiella oxitoca	2	0	1	1	2	0	1	1	2	0	2	0	2	0	1	1	1	1
Morganella morganii	1	0	0	1	1	0	0	1	1	0	1	0	1	0	0	1	0	1
Citrobacter freundii	1	0	0	1	1	0	0	1	1	0	1	0	1	0	0	1	0	1
Enterobacter aerogenes	1	0	0	1	1	0	1	0	1	0	1	0	1	1	0	1	0	1
Salmonella species	Not studied		Not studied		1	0	Not studied		1	0	1	0	Not studied		0	1	0	1

S; Susceptible, R; Resistant

References

1. Kala UK, Jacobs DW. Evaluation of urinary tract infection in malnourished black children. *Annals of Tropical Paediatrics* 1992; **12**: 75-81.
2. Saatci Ü. Idrar yolu enfeksiyonu. *Cocuk Sagligi ve Hastahklari Dergisi* 1994; **37**: 461-77.
3. Banapurmath CR, Jayamony S. Prevalence of urinary tract infection in severely malnourished preschool children. *Indian Pediatrics* 1994; **31**: 679-82.
4. Reed RP, Wegerhoff FO. Urinary tract infection in malnourished rural African children. *Annals of Tropical Peadiatrics* 1995; **15**: 21-6.
5. Berkowitz FE. Infections in children with severe protein-energy malnutrition. *Annals of Tropical Paediatrics* 1983; **3**: 79-83.
6. Issack H, Mbise RL, Hirji K. Nosocomial bacterial infections among children with severe protein energy malnutrition. *East African Medical Journal* 1992; **69**: 433-6.

Donors should help those in need, not themselves (1)

After 40 years of agreeing that it should be done, will the rich countries finally untie their aid? On June 20th the rich-country Organisation for Economic Co-operation and Development will meet for a last effort before the G8 summit in Japan to cut strings from aid for the poorest. They should wield their scissors freely.

Tied aid is help given on condition that the goods or services involved are provided by the giver. About half of the aid to the poorest countries remains tied in some way. To donors, it is a way of supporting their own firms of farmers as well as the poor. America's government can buy its farmers's grain surpluses and send them to feed Africans. European countries can buy water pumps at home and send them to thirsty India. Japan can hire its nationals to advise poor countries' governments, rather than paying others to do so.

But such help risks being driven by the givers' interests, not those of the needy.

Anon (Editorial). *The Economist* 17-23 June 2000, p 20.