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SCREENING OF FEBRILE CHILDREN ON HOSPITAL ADMISSION FOR URINARY TRACT INFECTIONS (UTI).

BY: ADEDOYIN O.T ; OYEYEMI B.O; AIYEDEHIN O.V., Department of Paediatrics, University of Ilorin Teaching Hospital, P.M.B. 1459, Ilorin. **Corresponding Author: DR. O.T. ADEDOYIN**, Department of Paediatrics, University of Ilorin Teaching Hospital, P.M.B. 1459, Ilorin.

Urinary tract infection (UTI) is one of the most often missed diagnosis in children in the tropics. This is because of the varied and similar presentation of UTI to other common illnesses. A total of 154 patients with various presumptive clinical diagnosis at admission were screened for the presence of UTI. Only 33 (21.4%) patients had proven UTI. Majority of these patients (20 or 60.6%) were aged < 5 years. The findings of UTI was more amongst patients with presumptive clinical diagnosis of bacteria infections (like sepsis, typhoid septicaemia, bronchopneumonia etc.), and severe malaria. The commonest organisms isolated were *Escherichia coli* 12(36,4%) and *Klebsiella* 12(36.4%). There was increased sensitivity of these organisms to both ceftazidime and the quinolones. It is concluded that there should be high index of suspicion of UTI in patients with bacteria infection (Localised or generalized) and severe malaria particularly those with black water fever.

INTRODUCTION

One of the most often missed diagnosis in paediatric wards in the tropics is urinary tract infections (UTI). This may be due to the inability of some category of paediatric patents to make complaints referable to the urinary tract. The varying and varied presentation of urinary tract infection particularly in children under 2 years where the clinical presentation of UTI could just be failure to thrive, anorexia, feeding difficulty, irritability and even vomiting may also be contributory (1). There is also the tendency to first suspect that most febrile illnesses in the tropics must be due to malaria. All these reasons may have contributed to making the diagnosis of UTI less common, yet UTI portends grave long-term consequence if not attended to promptly. Studies have shown that UTI whether symptomatic or asymptomatic are of greater significance in childhood than in adults as most renal scars occur after such infections within the first five years of life [2-4]. Furthermore about 20% of children with end stage renal disease would have had pyelonephritis earlier on in life(5).

In view of all these, the current study aim to determine the presence or absence of UTI in febrile paediatric admission cases at the University of Ilorin Teaching Hospital.

RESULTS

A total of 154 febrile children were screened for UTI during the study period. This includes 97males and 57females giving a male: female ratio of 1.7:1. The age range of the patient was 2months – 16years. There were a total of 32, 21, 38, 36, 24 and 3 patients in the age group 0-1,1-2,2-5,5-10, 10-15 and > 15years respectively. Majority 20(60.6%) were aged < 5years. More females 20(60.6%) than males 13(39.4%) had UTI. Only 3 patients died indicating 2% mortality. One of the three deaths was in a sickle cell disease patient managed for sepsis, who also has UTI due to coliform organisms.

Out of the 154 patients analysed, only 16 had symptoms referable to the urinary tract out of which 6(37.5%) were positive for UTI. Out of 26 cases of severe malaria screened, 5(19.2%) were positive for UTI with two of them having cerebral malaria, two had blackwater fever and one had severe anaemia

secondary to malaria (Table 2). Out of 40 patients with varied bacterial infection, 11 (27.5%) had proven UTI with majority of these cases, 7 (63.6%) having presumptive diagnosis of sepsis. Furthermore two of them had presumptive diagnosis of typhoid septicaemia including one who underwent operation for typhoid perforation. Three (17.6%) of 17 patients with malignancies had UTI, while only 1 (10%) of the 10 malnourished patients had UTI. That patient was also Human Immunodeficiency Virus (HIV) positive. Out of the 12 patients with renal disorders that developed fever and were screened for UTI, there were three (25%) cases of UTI. (Table 2).

The other cases of UTI occurred in the patients with Guillain-Barre syndrome, (GBS), spina bifida and a child with encephalitis/severe brain damage who was catheterised. The organisms isolated in the GBS and severe brain damage patients were E.coli and Klebsiella respectively, while candida was recovered in the patient with spina bifida (Table 2).

Outcome was not influenced by the presence of UTI as 2 (6.1%) out of 36 patents with UTI died compared to 1 (0.8%) out of 121 patients without UTI ($P<0.05$) (Table 4).

The commonest organism isolated were *Escherichia coli (E.coli)* in 12 (36.4%) patients and Klebsiella in 12 (36.4%). Others include coliform organism in 4 (12.1%), *Pseudomonas aeruginosa* 3 (9.1%) *streptococcus faecalis* 1(3.0%), and *candida* species 1(3.0%) (Table 5).

There was 88.9% sensitivity of *Escherichia coli* to ceftazidime, 85.7% sensitivity to ciprofloxacin, and 66.7% sensitivity to gentamicin and 70% sensitivity to ofloxacin.

There was 71.4% sensitivity of klebsiella to ceftazidime, 70% to ofloxacin, 90% to ciprofloxacin and 62.5% to gentamicin. There was 100% sensitivity of *coliform* to gentamicin, ofloxacin, ciprofloxacin and ceftazidime (Table 6).

TABLES

Table 1

Age ranges of subjects in the study with or without UTI.

Age Range (Years)	Presence of UTI	No UTI	Total	% with UTI
0 - 1	6	26	32	18.8
1- 2	6	15	21	28.6
2 - 5	8	30	38	21.1
5-10	8	28	36	22.2
10-15	5	19	24	20.8
> 15	0	3	3	0
	33	121	154	

Table 2

Clinical diagnosis of patients with and without UTI

Clinical Diagnosis	Presence of UTI	No UTI	Total	% with UTI
UTI	6	10	16	37.5
Severe malaria	5	21	26	19.2
Bacterial infection	11	29	40	27.5
Neurological disorders	3	0	3	100
Malignancies	3	14	17	17.6
Malnutrition	1	9	10	10
Renal disorders	3	9	12	25
Diarrhoeal illness	0	10	10	0
Sickle Cell Disease	1	6	7	14.3
Tetanus	0	10	10	0
Hepatitis	0	3	3	0
	33	121	154	

Table 3

Sex of subjects with and without UTI

Sex	Presence of UTI	No UTI	Total	% with UTI
Male	13	84	97	13.4
Female	20	37	57	35.1
Total	33	121	154	

Table 4

Outcome in subjects with and without UTI

Outcome	Presence of UTI	No UTI	Total	% with UTI
Dead	2	1	3	66.7
Alive	31	120	151	20.5%
Total	33	121	154	

Table 5

Organisms isolated in the subjects with UTI

S/NO	Organisms isolated	No UTI	% of Total
1	*Escherichia coli*	12	32
2	*Klebsiella spp.*	12	21
3	*Coliform*	4	38
4	*Pseudomonas aeruginosa*	3	36
5	*Streptococcus faecalis*	1	24
6	*Candida spp.*	1	3
		33	100%

Table 6

Sensitivity pattern of causative organisms of UTI to drugs tested in percentage (%)

	Drugs tested								
Organisms (%)	Gentam icin	Ofloxa -cin	Ciprof- loxacin	Ceftazi- dime	Nitro- furati on	Ampi- cillin	Tetra- cycline	Chlor am- pheni col	Strepto -mycin
E.coli	66.7	70	85.7	88.9	20	0	0	0	17
Klebsiella	62.5	100	90	71.4	33.3	0	42.9	0	50
Pseudomo nas	50	100	100	100	0	-	0	0	0
Coliform	100	100	100	100	0	0	0	0	0
Strept. Faecalis	100	0	0	-	-	0	0	0	100

FIGURES

Figure 1

Clinical diagnosis in the febrile patients used for the study.

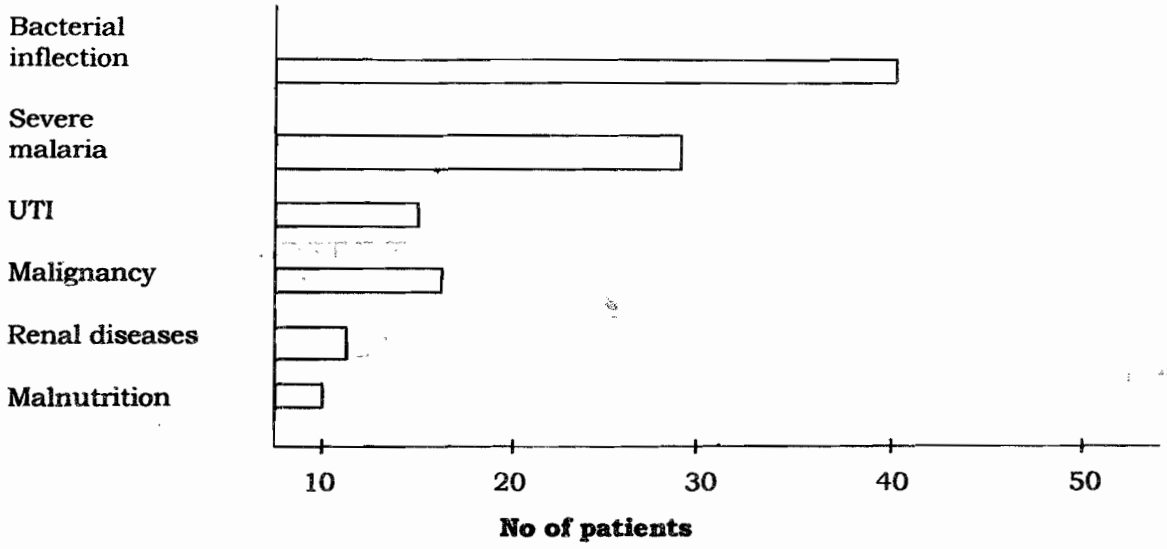
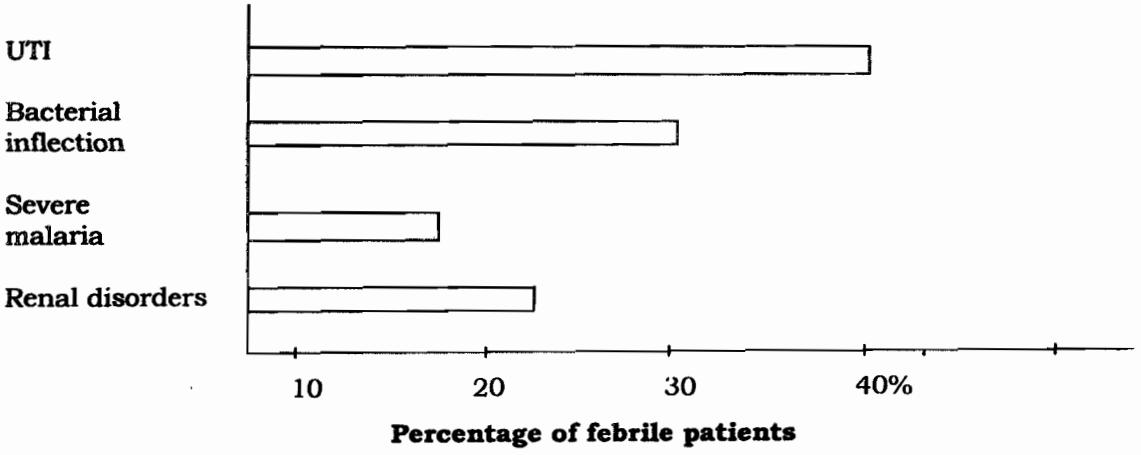


Figure 2

Percentage of febrile patients with the various clinical diagnosis that had UTI



DISCUSSION

The correct incidence of UTI is yet to be obtained in this part of the world as the current study shows that it either just get misdiagnosed as other common childhood illnesses or it could be an associated infection with other illnesses. This trend should be reversed as the management of UTI is usually painstaking in order to identify underlying causes or predisposing factors and to detect complications. Some of these potential complications like secondary vesico - ureteral reflux could lead to pyelonephritis which may produce renal scarring leading to hypertension and possibly end stage renal disease. It has been shown that most renal lesions in adult life may be antedated by untreated asymptomatic becteriuria in childhood.[5]

The finding of UTI amongst patients with bacterial infection especially sepsis is not surprising. This is because studies have shown that infants with fever, and ill general appearances and those who do not have a potential source of fever such as otitis media e.t.c. on examination have a higher prevalence of UTI.[6,7] however infants with unequivocal sources of fever on examination such as meningitis etc. are also at risk for UTI but have the lowest prevalence of < 2% [6,8]. However haematogenous spread of organism causing UTI is commoner in neonates while in older children the mode of spread of the organism is through an ascending infection.[9] The finding of UTI in patients with typhoid septicaemia is also not surprising since the organism could be seeded in the kidney and subsequently excreted in urine, but it is puzzling that the organism responsible for the UTI is not salmonella typhi but rather *E.coli* and Klebsiella in the two cases seen. It may be that the immunosuppression which may follow typhoid septicaemia makes them susceptible to infection with other organisms (10).

The finding of UTI in patients with malaria indicates that the real cause of the fever may be malaria but there may also exist an underlying asymptomatic UTI because these patients did respond to antimalarial chemotherapy as evidenced by subsidence of the fever. Asymptomatic bacteriuria is very common in children. Workers have reported prevalence of as much as 5% in some studies.[11-13] It may also be that the tubular necrosis resulting from haemoglobinuria as a result of severe malaria predisposed some of them to UTI.

The finding of UTI in patients with Nephrotic syndrome and malnutrition is in agreement with the findings of Ibadin[14] and Ojuawo [15] respectively. However while the major organisms causing UTI in patients with nephrotic syndrome seen in the Ibadin[14] studies were staphylococcus and untyped coliform. *E.coli* and *klebsiella* were recovered form the two Nephrotic patients with UTI in this study. Furthermore while *Klebsiella* was the predominant organism causing UTI in malnourished patient in the Ojuawo [15] series, *E.coli* was recovered from the only malnourished patient with UTI in this study.

The finding of UTI in patient with malignancies may be as a result of immunosuppression from the disease or the drugs. But one would have expected some opportunistic organisms being responsible. This was not the case here as *E.coli* and *Pseudomonas* were the offending organisms. The finding of UTI in bedridden patients who were catheterized is also not surprising as prolonged catheterization is capable of resulting in complication of UTI.

The finding of *Escherichia coli* as the commonest organism causing UTI in children is in agreement with findings by other workers [12,15]. It also indicate that the trend of causative organism of

UTI has not changed. However there was increased sensitivity of the organisms causing UTI to ceftazidime, a third generation cephalosporin and the quinolones. The sensitivity of organisms to ceftazidime agrees with recent findings by other workers (14,15). This is not a cheering news, as the third generation cepholosporins are expensive while the quinolones are contraindicated in children and adolescents in the growth phase. Sensitivity of these organisms to the highly recognized cotrimoxazole was not done but there was reduced sensitivity of these organisms to gentamicin, ampicillin which were once reliable drugs in the treatment of UTI.

It is concluded that there should be a high index of suspicion of UTI in patients with bacteria infection localized or generalized and patients with severe malaria particularly those with blackwater fever. In view of the fact that the sensitivity of these organisms to cotrimoxazole was not tested, it should be noted with caution that ceftazidime and quinolones may be replacing the old reliables.

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