Recurrent Urinary Tract Infection Treatment Protocol in Sinnar Females

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Abstract:

Back ground: Urine culture and sensitivity testing are the standard diagnostic investigations to detect the causative organism and to determine the type of antimicrobial therapy needed.(1, 2) A UTI is defined as a positive urine culture with greater than 100,000 colony-forming units (cfu)/ml. In acute cystitis, even 1,000 cfu/ml and in acute pyelonephritis 10,000 cfu/ml may be sufficient for diagnosis in a symptomatic patient. A urine culture is recommended in a RUTI or in the presence of complicating factors.(2, 3) A urine culture can remain positive for more than two weeks even after treatment in cases of chronic UTIs or RUTIs.

A 'clean-catch' or midstream technique needs to be used when collecting the urine sample, which reduces the risk of vaginal and skin contamination to approximately 30%.(4) Urinalysis, either by dipstick or microscopy, for the detection of pyuria, as a method for predicting a UTI has a sensitivity of 80–90% and a specificity of 50%, but it only detects those bacteria which reduce nitrates to nitrites in the urine. Bacteria such as Staphylococcus.

Methods: This study was carried out in Sinnar teaching hospital, in the period from the first of January up to the end of October 2016. The data was collected from 110 females presented with more than 3 episode of UTI, causative organism is isolated and some antibiotics were tested for sensitivity.

Result: The study concluded that 58% the patients were sensitive to oflaxcin, 50% to cetrixone and 44% to gentamycin. Significant resistant was observed in naldixic acid (73%), cotrimixzole (69%), amoxiclave(65%), and to norfloxacin (44%). It is clear that wide use of empirical antibiotic results in broad resistance seen in this study compared to universal ones.

*Conclusion: This study is in line with universal studies in affectivity of ofloxacin which is new drug not widely used in contrast to old drugs like cotrimaxzole and norfloxacin which show high resistance in contrast to universal studies. *

Key words: Recurrent Urinary Tract Infection Treatment Protocol, Sinnar Females

INTRODUCTION

Antimicrobial therapy is the core treatment for UTIs, with the main objective being the eradication of bacteria growth in the urinary tract through an efficacious, safe and cost-effective antimicrobial agent. This can be achieved within hours if the antibiotics are maintained at sufficient urine levels.(5) In order to ensure compliance and be patient-friendly, the drug should be given for a short period of time to prevent bacterial resistance. Antimicrobial agents should be prescribed according to the susceptibility of the infecting bacteria, the concentrations of uropathogens in the urine and the urinary complaint. This is important to consider when there is septicaemia or parenchymal infection, as antimicrobials are usually at higher levels in the urine than in serum.(6) Dose modification is required for patients with renal insufficiency and in the case of

other factors such as: age, pregnancy or lactation status, primary or recurrent infections, hospitalised patients, DM, liver disease, an immuncompromised state, hydration levels and psychiatric problems.(7) A variety of antimicrobials are used for the prevention and management of RUTIs.(6, 8, 9, 10, 11, 12, 13, 14, 15) A Cochrane review has shown that antibiotics in comparison to a placebo are more effective in preventing recurrences in pre- and postmenopausal women with RUTIs.(8) The criteria for the selection of the most effective antibiotic depend on a patient's pattern of resistance, adverse effects, interaction with drugs and cost. Ampicillin, amoxicillin, and sulfonamides are no longer the drugs of choice for empirical treatment because of the widespread emergence of resistance in 15–20% of *E. coli* in several areas of the USA and other countries.(16, 17, 18, 19) Nitrofurantoin or amoxicillin/clavulanic acid remain effective in terms of bacterial sensitivity, but nitrofurantoin needs to be avoided in patients with pyelonephritis because of its poor serum and tissue levels. Less than 5% of *E. coli* strains are resistant to nitrofurantoin, whereas other strains are often resistant to it. The rate of *E. coli* resistance to fluoroquinolones, even in uncomplicated UTIs, varies between countries with rates reported as 0.5–7.6% in Europe,(20) 15% in Korea,(21) and up to 35% in some parts of India.(22)Penicillins and cephalosporins are considered safe during pregnancy, but trimethoprim, sulphonamides, and fluoroquinolones should be avoided. Oral antibiotic therapy resolves 94% of uncomplicated UTIs, although recurrence is not uncommon. In the recently published *International Clinical Practice Guidelines for the Treatment of Acute Cystitis*, a 3-day regimen of trimethoprimsulfamethoxazole (TMP-SMX) and a 5-day course of nitrofurantoin are recommended as a first-line therapy for the management of uncomplicated UTIs. A 5-day course of nitrofurantoin has an efficacy equivalent to a 3-day TMP-SMX course.(23, 24) A 3- to 7-day regimen of beta-

lactams, such as cefaclor or amoxicillin/clavulanic acid, is appropriate when first-line therapies cannot be used.(18, 23) Although a 3-day course of fluoroquinolones can be quite effective, it is not usually recommended as first-line therapy because of the emerging resistance to them and their potential side effects, as well as the high cost; nevertheless, fluoroquinolones are the drug of choice in women who are experiencing low tolerance or an allergic reaction after empirical therapy.(23, 25) In a meta-analysis, a single-dose regimen of fosfomycin trometamol has been shown to be a safe and effective alternative for the treatment of UTIs in both pregnant and non-pregnant women, as well as in elderly and paediatric patients, but it seems to be slightly less effective than the above mentioned therapies.(18, 23, 26) Pivmecillinam in a 3-to 7-day course is also effective, but not available in most regions. Because of its poor efficacy, amoxicillin and ampicillin should not be used for the empirical treatment of UTIs.(23) TMP-SMX and fluoroquinolones prevent RUTI by inhibiting the recovery rate of uropathogens (especially *E. coli*) from the faecal reservoir,(27) while nitrofurantoin plays its role in the treatment of RUTI by sterilising the urine and inhibiting bacterial attachment.(28, 29, 30) A follow-up urinalysis and urine culture, also called the 'test of cure', is not indicated in women with uncomplicated UTIs, but should be performed in those women who are suffering from RUTIs or a complicated UTI. Different antibiotic prophylaxis regimens such as continuous prophylaxis, post-coital prophylaxis and acute self-treatment are important management strategies in preventing RUTIs. Patient self treatment is recommended in cases of those with ≤2 episodes of UTIs per year, whereas continuous antimicrobial prophylaxis, low-dose prophylaxis, or post-coital prophylaxis is generally considered in ≥3 episodes of UTIs annually.(10)

PROBLEM

Empirical antibiotics has being widely used for treating UTI among females, generating new serious types of organism resistant to most of available antimicrobial in the market, leading doctors to upgrading levels of antibiotics, reducing cost effectiveness, and increasing morbidity, this study try to put antibiogram   for the most common isolated microorganism affecting Sinner's females

MATERIAL AND METHOD

This study is conducted in Sinnar teaching hospital in the period from first of January up to end of October 2006, the data collected from 110 females with history of more than 3 episodes of urinary tract infection, urine culture was done, the causative microorganism was isolated. Commonest used, available, cost effective antibiotics has being tested for sensitivity, the data were collected using master sheet containing these finding and personal data was performed, analyzed by SPSS program, tested antibiotic is calcified in order manner using most sensitive at first.

OBJECTIVE

The general objective of this study is to put protocol for treatment of recurrent UTI in Sinnar females using the corresponding   antibiogram   for   commonest   causative microorganism.

RESULTS

Table (1) Age Frequency and Percentage:

Cumulative percent	Valid percent	Percent	Frequency	
14.5	14.5	14.5	16	0 – 20 valid
50.9	36.4	36.4	40	20 – 40
100.0	49.1	49.1	54	More than 40
	100.0	100.0	110	Total

Table (2) Organism Frequency and Percentage

Cumulative percent	Valid percent	Percent	Frequency	
30.9	30.9	30.9	34	E.coli
67.3	36.4	36.4	40	Coliform
80.9	13.6	13.6	10	Staph aureus
99.1	18.2	18.2	20	Cedeceadavicae
100.0	0.9	0.9	1	Pseudomonas
	100.0	100.0	110	Total

Table (3) CEFTRIXO * ORGANISM Cross tabulation

	ORGANISM						
Total	pseudomonus	cedecea	staff	coliform	E. coli		
45	1	5	4	11	24	resistance	CEFTRIX
55	0	14	8	25	8	sensitive	
10	0	1	3	4	2	intermediate	
110	1	20	15	40	34	Total	

Table (4) OFLOXACI * ORGANISM Cross tabulation

	ORGANISM						
Total	pseudomonus	cedecea	staff	coliform	E. coli		
42	1	7	7	14	13	resistance	Ofloxacin
64	0	13	8	23	20	sensitive	
3	0	0	0	2	1	intermediate	
1	0	0	0	1	0	not done	
110	1	20	15	40	34	Total	

Table (5) COTRIMIX * ORGANISM Cross tabulation

Total	ORGANISM					
	pseudomonus	Cedecea	staff	Coliform	E. coli	
76	1	14	11	28	22	resistance COTRIMIX
32	0	6	3	11	12	sensitive
2	0	0	1	1	0	intermediate
110	1	20	15	40	34	Total

Table (6) NADIXIC * ORGANISM Cross tabulation

Total	ORGANISM					
	pseudomonus	Cedecea	staff	Coliform	E. coli	
80	1	14	13	32	20	resistance NADIIC
22	0	4	1	8	10	sensitive
7	0	2	1	0	4	intermediate
110	1	20	15	40	34	Total

Table (7) AMOXICIL * ORGANISM Cross tabulation

Total	ORGANISM					
	pseudomonus	Cedecea	staff	Coliform	E. coli	
72	1	10	9	25	27	resistance AMOXICIL
29	0	8	4	12	5	sensitive
8	0	2	2	2	2	intermediate
1	0	0	0	1	0	not done
110	1	20	15	40	34	Total

Table (8) NORFLOXA * ORGANISM Cross tabulation

Total	ORGANISM					
	pseudomonus	Cedecea	staff	Coliform	E. coli	
48	1	13	4	16	14	resistance NORFLOXA
30	0	2	7	11	10	Sensitive
15	0	3	0	7	5	intermediate
17	0	2	4	6	5	not done
110	1	20	15	40	34	Total

Table (9) GENAMYCI * ORGANISM Cross tabulation

Total	ORGANISM					
	pseudomonus	Cedecea	staff	Coliform	E. coli	
13	0	1	3	3	6	resistance GENAMYCI
47	1	12	7	17	10	Sensitive
7	0	1	0	3	3	intermediate
43	0	6	5	17	15	not done
110	1	20	15	40	34	Total

Discussion

The study has been done in sinnar teaching hospital, on 110 patients all of them were females with recurrent UTI (more than 3 episode), 45 % of them were more than 50 years old , 36 % of them between 20 – 40 years old and 15 % less than 20 Years old (table 1).

On the other hand table 2 showed that 36 % of patient were infected with Coliform, 31 % E.coli, 18 % Cedecea davicae, 15 % Staphylococcus aureus and only 1 % Pseudomonas spp .

This study showed that the most effective antibiotic was ofloxacin with total of 58% sensitive   while 38 % of total were resistant and 3 % intermediate and only 1% not done, it is effective by 59% in E.coli ,58 % Coliform ,53 % s.aureus , 65% Cedecea davicae and non in Pseudomonus it is only one case (table3), ofloxcin is more sensitive than other quinlones which shows high resistance(62%) as found by Milton et al 2009(*).

The next sensitive antibiotic was Ceftriaxone with total of 50 % and 41% resistant while 9% of total were intermediate , it is effective by 63 % in Coliform , 23% in E.coli , 53% in S.aureus , 70 % Cedecea and non in Pseudomonus (table 4).

Gentamycin come in the third order in the sensitivity by 43% and 12% resistant while 6 % were intermediate and 39% not done, it is effective by 29% in E.coli ,43% Coliform ,47 %

s.aureus, 60% Cedecea davicae and 100% in Pseudomonus it is only one case. (table4)

It seems that gentamycin is the most effective antibiotic but the percentage reduces because of large proportion not tested for sensitivity.

The forth order is for the cotrimixazol with total of 29% Sensitive an 69% resistance while 2 % intermediate. it is sensitive by 38% in E.coli , 34% in Coliform, 19% cedecea , 9% s.aureus, this is against Milton et al (2009) in brazil who clarified that cotrimixazol is sensitive by 64%(*) .

Next of the cotrimixazol is the Norfloxacin which is sensitive by 27% of total   while 44% resistant ,14% intermediate and 15% not done which is sensitive by 33% in E.coli ,37 % in coliform ,23% s.aureus and 7% cedecea

 The next one is Amoxiclave which is sensitive by 26% of total while 65% resistant ,7% intermediate and 1% not done and is sensitive by 17% in E.coli ,41 % in coliform ,14% s.aureus and 28% cedecea, these finding in contrast to Milton et al 2009 who found that 78% of patients were sensitive to it, this can explained by wrong, blind, wide use of Amoxiclave in this area(*).

The last one is the Naladixic acid which is sensitive by 20% of total while 73 % resistant ,6% intermediate which is sensitive by 45% in E.coli ,36 % in coliform ,5% s.aureus and 18% cedecea davicae .

RECOMMENDATIONS:

After the enumeration of the results that are related to the following study, there are some ideas which could help further in the field of the research and are better to be recommended as follow:

- The patient have to take sample for culture and Sensitivity immediately after diagnosis of UTI before start any treatment
- After taking the sample of culture the patient could start with ofloxacin as a first choice of antibiotic or ceftriaxone.
- Any hospital most have antibiogram annually for empirical treatment of UTI.
- We need further research on husbands of females with RUTI.

CONCLUSIONS:

This study has been done in Sinnar Teaching Hospital 110 female patients with RUTI on all age's group.

The goal of the study is to put plan for management of most common microorganism that causing recurrent UTI in females in Sinnar teaching hospital.

The study concluded that 58% the patients were sensitive to oflaxcin, 50% to ceftriaxone and 44% to gentamycin. Significant resistant was observed in naldixic acid (73%), cotrimixzole (69%), amoxiclave(65%), and to norfloxacin (44%).

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