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Antibiogram sensitivity in urinary tract infections (UTI) at el batnan medical center- tobruk - libya

Abstract

The aim of this study is to identify the most common bacteria that cause UTI and to rationalize antibiotic guidelines for UTI to optimize outcome and to minimize resistance at a reasonable cost to the patient and the community. In a clinical trial to identify the sensitivity/resistance pattern of ten different antimicrobial agents commonly used in the treatment of urinary tract infections (UTI) in El Batnan Medical Center (BMC), Tobruk-Libya, during 2003 and 2004. A total of 773 midstream urine samples from outpatients and inpatients attended Central Lab in El Batnan Medical Center (BMC) clinically suspected as having UTI, were examined for microbiological confirmation and pattern of antibiotic susceptibility by disc diffusion method. By using direct smear microscopy and routine culture methods, 8 different bacterial species were isolated from only 262 (33.9%). The remaining 511 (66.1%) of cases showed no bacterial growth.

Bacteriological examination of the urine samples showed *Escherichia coli* strains isolated in 106 (40.4%) of cases with UTI, *Klebsiella* in 59 (22.5%), *Staph epidermidis* in 35 (13.3%), *Staph aureus* in 32 (12.2%), *Proteus* spp in 12 (4.5%), while 8 (3%), 6 (2.3%), 4 (1.5%) of cases showed *Pseudomonas*, *Entrococci* and *Corynebacteria* respectively. The study of the antimicrobial sensitivity/resistance pattern of ten different antimicrobial agents commonly selected in the treatment of UTIs, indicated that the antimicrobial drug of choice for treating UTI caused by *Escherichia coli* strains, *Klebsiella*, *Staph. epidermidis*, *Staph. aureus,* and *Proteus* spp. should include Ciprofloxacin (80.2% sensitivity), or Amoxicillin (70.2% sensitivity), or Nitrofurantion (64.5% sensitivity), or Ceftriaxone (61.8% sensitivity). Meanwhile, for treating UTI produced by *Entrococci*, the antimicrobial drug of choice is Amoxicillin (70.2% sensitivity), Naldixic acid (60.3% sensitivity), and Ampicillin (9.2% sensitivity), while for treating *Pseudomonas* spp, the drug of choice should be member of Fluoroquines group as Ciprofloxacin (80.2% sensitivity), and Sulphamethoxazol + Trimethoprim (Co-trimoxazole) (26.3% sensitivity).

Keywords: urinary tract infections (uti), significant bacteruria, disc diffusion method, antibiotic sensitivity/resistance, empirical treatment

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Introduction

Antibiotics are used to prevent infection and to treat patients with proven or suspected infection. The aim is to administer a safe and cost effective dose of antibiotic that will eliminate the infecting or potentially infecting organism. Antibiotics are widely used, contributing to 35% of all prescriptions in health care facilities. Overuse of antibiotics results in bacterial resistance not only to the antibiotic prescribed, but often to other antibiotics in the same classes or groups. The abuse or misuse of antibiotics is costly because it leads to the emergence of antibiotic resistance among microorganisms in the health care facility environment as well as in the patients. When infections from Antimicrobial Resistant Organisms occur, there is increased mortality, especially among those with underlying diseases or multi organ failure.

In[1] the past 30–50 years, the natural history of urinary tract infection (UTI) has changed as a result of the introduction of antibiotics and improvements in healthcare. This change has contributed to uncertainty about the most appropriate and effective way to manage UTI and whether or not investigations and follow-up are justified. UTI is a common bacterial infection in children, found in up to 5% of all febrile children under the age of 2 years presenting to emergency rooms (Van der Voort 1997) and with an incidence of 0.43/1000 patients per year in general practice Nordenstam GR, et al.[2] A population-based study from the UK based on referral data collected over 4 years suggested that 11.3% of females and 3.6% of males will have had a UTI by the age of 16 Coulthard et al.[3] Studies suggest that UTI has the incidence of first time and recurrent episodes of UTI in general practice ranges from 0.6% and 1.1% in boys and girls, respectively, aged under 1 year while it changes to 0.2% and 1.4% for boys and girls, respectively, aged between 5 and 14 years Jadresic L et al.[4]

Coulthard et al.[5] showed that an education model when combined with prompt diagnosis and access to a nurse led UTI service increased the pickup rate of patients appropriately diagnosed with UTI by four times that of the control group. Different antimicrobial regimens have been used in the treatment of UTI, differing in both type and duration of treatment. However, there is no consensus as to which antimicrobial should be used and how long treatment should be continued. In this study, we try to achieve more consistent clinical practice, based on accurate laboratory diagnosis and effective management hence reducing the emergence of other resistant forms of bacteria and minimizing the costs due to unnecessary antibiotic abuse.

Materials and methods

A total of 772-midstream urine samples sent for microbiological study at the Central Lab. of El Batnan Medical Center, were studied during four months (October and November 2003 and 2004). Patients were clinically diagnosed according to criteria already established for UTI diagnosis Klein RS.[6]

Collection of specimens

A clean midstream urine sample is the recommended method for urine collection. In babies and infants urine samples were collected in sterile self adhesive plastic bags Liaw LCT et al.[7] When it was not possible or practical to collect urine by non-invasive methods, catheter samples 23(2.97%) or suprapubic aspiration (SPA) 7 (0.9%) used. Before SPA is attempted, ultrasound guidance should be used to demonstrate the presence of urine in the bladder. Samples were sent to the laboratory within one hour after voiding when possible or kept refrigerated at 40C to avoid multiplication of bacteria in urine resulting in false significant bacteruria Abla M El-Mishad.[8,9]

Used laboratory technique

Direct smear microscopy and routine bacterial cultures included the following materials

i. Clean containers →to collect stool specimen

ii. Bacteriological loops→ for inoculation of culture media.

iii. Swabs→ used for spreading of colonies on nutrient agar for "antibiotic sensitivity test"

iv. Forceps→ for putting antibiotic discs on nutrient agar for "antibiotic sensitivity test".

Direct smears from urine deposits after centrifugation were stained with Gram's stain.

Culture media

MacConkey agar (European pharmacopoeia). For study of coliform organisms.

Laboratorios CONDA La Forja, g- 28850 Torrejon de Ardoz – Madrid (Spain)

Preparation: Suspend 50 grams of the medium in one litre of distilled water. Mix well until a uniform suspension is obtained. Heat with frequent agitation and boil for one minute until completely dissolved. Cool to 45^{0}C and pour in Petri dishes. Allow the plates to solidify and place them upside down to avoid excessive moisture on the surface of the medium.

i. Mueller –Hinton agar (OXOID CM0337)

ii. Typical formula (g/l) pH 7.3 at 25^{0}C

iii. Beef, dehydrated infusion from 300.0

iv. Casein hydrolysate 17.5; Starch 1.5; Agar 17.0

Oxoid Ltd., basingstke, hampshire, england

Preparation: Suspend 38 grams of the medium in one litre of distilled water. Bring to the boil to dissolve the medium completely. Sterilize by autoclaving at 121^{0}C for 15 minutes.

I. COLUMBIA agar base (OXOID CM0331)

II. Typical formula (g/l) pH 7.3 at 25^{0}C

III. Special peptone 23.0; Starch 1.0; Sodium chloride 5.0; Agar 10.0

Oxoid Ltd., basingstke, hampshire, england

Preparation: Suspend 39 grams of the medium in one litre of distilled water. Bring to the boil to dissolve the medium completely. Sterilize by autoclaving at 121^{0}C for 15 minutes. Cool to 50^{0}C and add 5% sterile defibrinated blood. For identification and quantitation, all bacteria were cultured on MacConkey's agar medium. Blood agar medium, Nutrient agar media and incubated over night at 37°C. The colonies are further identified by morphology, Gram staining and API biochemical reactions. The quantitation of bacteria in urine samples was done using calibrated loops for cultivation Jawetz, et al.[10]

Antibiotic discs → for antibiotic sensitivity test

Were supplied by Himedia Laboratories PVT. LTD. 23, Vadhani Ind, Est., LBS Marg, Mumbai- 400086, India, and Oxoid LTD., DasinGstoke, Hampsttire. England.

Antibiotics used (with their abbreviations):

1) Ampicillin "AMP" 2) Amoxicillin "AMC"

3) Nalidixic acid "NA" 4) Ceftriaxone "CRO"

5) Suplha methoxazol + trimethoprim "SXT" 6) Cephalothin "KF"

7) Ciprofloxacin "CIP" 8) Nitrofurantion "F"

9) Chloramphenicol "C" 10) Doxacycline "DO"

Susceptibility tests

Disc diffusion method of "antibiotic sensitivity test"

Steps: Emulsify several colonies of the test organism in nutrient agar and incubate over night at 37°C.

Put antibiotic disc on plate by the forceps and incubate the plate aerobically at 37°C over night.

In the next day, take the readings for antibiotic sensitivity and resistance.

The reaction of the test organism to each antibiotic is reported as follow:

i. Sensitive: Big zone of inhibition.

ii. Intermediate: intermediate zone of inhibition.

iii. Resistant small or no zone of inhibition.

Results

The study was done on a total of 773 urine samples from patients clinically diagnosed as UTI in Al-Batnan Medical Center, during four months October and November 2003, October and November 2004. Out of the 773 cases examined microbiologically 262 showed positive growth on bacterial cultures, 173(66%) of them were children under 12 years old. UTI patients with no bacterial growth, represent 511(66.1 %), meanwhile cases with positive bacterial growth, represent 262(33.99%) (Table I). The isolated pathogenic bacteria causing UTIs were *Escherichia coli* strains isolated in 106 (40.46%)

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in cases with UTI, *Klebsiella* in 59 (22.52%), *Staph epidermidis* in 35 (13.3%), *Staph aureus* in 32 (12.12%), *Proteus* spp in 12 (4.5%), while 8 (3.05%), 6 (2.29%), 4 (1.53%) of cases were produced by *Pseudomonas*, *Entrococci* and *Corynebacteria* respectively Table 2.

Table 1 Frequency (%) of cases with positive cultures

Month	No of Cases with UTI	No of Cases with Positive Culture	Percentage (%)
October 2003	197	58	29%
November 2003	150	62	41%
October 2004	244	91	37%
November 2004	182	51	28%
Total	733	262	100%

Table 2 This table shows the frequency (%) of pathogenic bacteria in positive culture cases

Pathogenic Bacteria	No of Positive Culture Cases	Frequency (%)
Escherichia coli strains	106	40.46%
Klebsiella	59	22.52%
Staph epidermidis	35	13.35%
Staph aureus	32	12.12%
Proteus spp	12	4.58%
Pseudomonas	8	3.05%
Entrococci	6	2.29%
Corynebacteria	4	1.53%
Total	262	100%

UTI and asymptomatic bacteriuria are common in the elderly, most often due to *Escherichia coli (E. coli)* colonization. (Figure 1) for example, in one study the prevalence of bacteriuria in an elderly ambulatory population was 18 % in women and 6 % in men. The prevalence increases in women, with age and institutionalization Boscia JA et al.[11] The study was done on 10 groups of antibiotics with different mode of actions. *Escherichia coli* is the commonest cause of urinary tract infections especially in children, it was isolated from 106 (40.46%) cases with clinically suspected UTI. The pattern of antibiotic sensitivity for that isolated *Escherichia coli* strains from urine samples was as follows: Ampicillin 9.4%, Amoxycillin 70.8%, Nalidixic acid 67.9 %, ceftriaxon 73.6%, sulpha methoxazol + trimethoprim 25.5%, cephlothin 21.7%, ciprofloxacillin 85.5 %, Nitrofuranatian 71.7%, chloramphenicol 48.1%, Doxacycline 21.7% (Table 3).

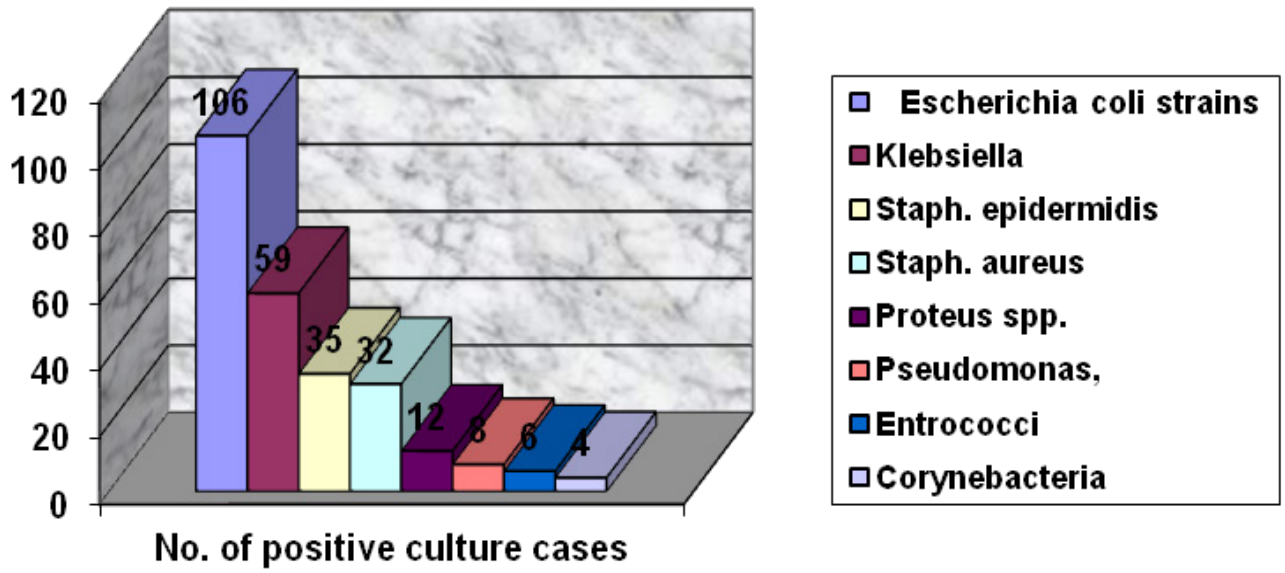

Figure 1 No of positive culture cases.

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Table 3 Shows antibiotics sensitivity/resistance pattern for isolated *Escherichia coli* strains from urine samples

	Antibiotic	Frequency		%	
		Sensitive	Resistance	Sensitive	Resistance
1	Ampicillin (AMP)	10	96	9.4%	90.6%
2	Amoxycillin (AMC)	75	31	70.8%	29.2%
3	Nalidixic acid (NA)	72	34	67.9%	32.1%
4	Ceftriaxone (CRO)	78	28	73.6%	26.4%
5	Sulphamethoxazol + Trimethoprim(SXT)	27	79	25.5%	74.5%
6	Cephalothin (KF)	23	83	21.7%	78.3%
7	Ciprofloxacin (CIP)	91	15	85.8%	14.2%
8	Nitrofurantion (F)	76	30	71.7%	28.3%
9	Chloramphenicol (C)	51	55	48.1%	51.9%
10	Doxacycline "DO"	23	83	21.7%	78.3%
	Total	106			

Klebsiella organisms are Gram negative, non motile, capsulated bacilli represented 59 (22.52%) from all isolated cases. Its pattern of antibiotic sensitivity was as follows: Ampicillin 0%, Amoxycillin 71.2%, Nalidixic acid 59.3%, Ceftriaxon 67.8%, Sulphamethox-azol+Trimethoprim 20.3%, Cephlothin 20.3%, Ciprofloxacillin 71.2%, Nitrofuranation 52.5%, Chloramphenicol 57.6%, Doxacycline 25.4% (Table 4). *Klebsiella* organisms are Gram negative, non motile, capsulated bacilli represented 59 (22.52%) from all isolated cases. Its pattern of antibiotic sensitivity was as follows: Ampicillin 0%, Amoxycillin 71.2%, Nalidixic acid 59.3%, Ceftriaxon 67.8%, Sulphamethox-azol+Trimethoprim 20.3%, Cephlothin 20.3%, Ciprofloxacillin 71.2%, Nitrofuranation 52.5%, Chloramphenicol 57.6%, Doxacycline 25.4% (Table 5). *Staphylococcus epidermidis* are Gram positive cocci arranged in clusters, Novobiocin sensitive and coagulase negative were isolated from 35 (13.35%) cases with UTIs. Its pattern of antibiotic sensitivity was as follows Ampicillin 8.5%, Amoxycillin 82.8%, Nalidixic acid 40.0%, Ceftriaxon 42.8%, Sulphamethoxazol + Trimethoprim 27%, Cephlothin 83.8%, Ciproflxacillin Hcl 81.1%, Nitrofuranatian 78.4%, Chloramphenicol 20%, Doxacycline 31.4% (Table 6).

Table 4 Shows antibiotic sensitivity/resistance pattern for isolated *Klebsiella* from urine samples

	Antibiotic	Frequency		%	
		Sensitive	Resistance	Sensitive	Resistance
1	Ampicillin (AMP)	0	59	0.00%	100.0%
2	Amoxycillin (AMC)	42	17	71.2%	28.8%
3	Nalidixic acid (NA)	35	24	59.3%	40.7%
4	Ceftriaxone (CRO)	40	19	67.8%	32.2%
5	Sulphamethoxazol + Trimethoprim(SXT)	12	47	20.3%	79.7%
6	Cephalothin (KF)	12	47	20.3%	79.7%
7	Ciprofloxacin (CIP)	42	17	71.2%	28.8%
8	Nitrofurantion (F)	31	28	52.5%	47.5%
9	Chloramphenicol (C)	34	25	57.6%	42.4%
10	Doxacycline "DO"	15	44	25.4%	74.6%
	Total	59			

Table 5 Shows antibiotic sensitivity/resistance pattern for isolated *Staph aureus* from urine samples

	Antibiotic	Frequency		%	
		Sensitive	Resistance	Sensitive	Resistance
1	Ampicillin (AMP)	3	29	9.4%	90.6%
2	Amoxycillin (AMC)	23	9	71.9%	28.1%
3	Nalidixic acid (NA)	24	8	75.0%	25.0%
4	Ceftriaxone (CRO)	13	19	40.6%	59.4%
5	Sulphamethoxazol + Trimethoprim(SXT)	5	27	15.6%	84.4%
6	Cephalothin (KF)	17	15	53.1%	46.9%
7	Ciprofloxacin (CIP)	24	8	75.0%	25.0%
8	Nitrofurantion (F)	20	12	62.5%	37.5%
9	Chloramphenicol (C)	15	17	46.9%	53.1%
10	Doxacycline "DO"	12	20	37.5%	62.5%
	Total	32			

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Table 6 Shows antibiotic sensitivity/resistance pattern for isolated *Staph Epidermidis* from urine samples

	Antibiotic	Frequency		%	
		Sensitive	Resistance	Sensitive	Resistance
1	Ampicillin (AMP)	3	32	8.5%	91.5%
2	Amoxycillin (AMC)	29	6	82.8%	17.2%
3	Nalidixic acid (NA)	14	21	40.0%	60.0%
4	Ceftriaxone (CRO)	15	20	42.8%	57.2%
5	Sulphamethoxazol + Trimethoprim(SXT)	9	26	27.0%	73.0%
6	Cephalothin (KF)	29	6	83.8%	16.2%
7	Ciprofloxacin (CIP)	28	7	81.1%	18.9%
8	Nitrofurantion (F)	27	8	78.4%	21.6%
9	Chloramphenicol (C)	7	28	20.0%	80.0%
10	Doxacycline "DO"	11	24	31.4%	68.6%
	Total	35			

Enterococci are Gram positive cocci arranged in short chains or mostly in pairs, and catalase negative were isolated from 6 (2.29%) cases with UTIs. Its pattern of antibiotic sensitivity was as follows Ampicillin 83.3%, Amoxycillin 100%, Nalidixic acid 66.7%, Ceftriaxon 100%, Sulpha methoxazol + Trimethoprim 0%, Cephlothin 83.3%, Ciprofloxacillin 50%, Nitrofuration 33.3%, Chlooramphenicol 50%, Doxacycline 0% (Table 7). *Pseudomonas spp are* motile Gram negative bacilli, strictly aerobic and non-spore forming bacteria. The only species pathogenic for human, pyocyanin, which give the colour to "blue pus", were isolated from 8 (3.05%) cases with UTIs. Its pattern of antibiotic sensitivity/resistance as follows: Ampicillin 0%, Amoxycillin 0%, Nalidixic acid 12.5%, Ceftriaxon 25%, Sulpha methoxazol + Trimethoprim 100%, Cephlothin 0%, Ciprofloxacillin 87.5%, Nitrofuration 0%, Chlooramphenicol 0%, Doxacycline 12.5% (Table 8). *Proteus spp.* are enterobacteriaceae characterized by swarming motility and urease production, represent 12 (4.58%) from all isolated cases. Its pattern of antibiotic sensitivity was as follows: Ampicillin 0%, Amoxycillin 41.6%, Nalidixic asid 50%, Ceftriaxon 66.6%, Sulphamethoxazol + Trimethoprim 50%, Cephlothin 16.6%, Ciprofloxacillin 75%, Nitrofuranatian 66.6%, Chloramphenicol 41.6%, Doxacycline 25% (Table 9).

Table 7 Shows antibiotic sensitivity/resistance pattern for isolated *Enterococci* from urine samples

	Antibiotic	Frequency		%	
		Sensitive	Resistance	Sensitive	Resistance
1	Ampicillin (AMP)	5	1	83.3%	16.7%
2	Amoxycillin (AMC)	6	0	100.0%	0.0%
3	Nalidixic acid (NA)	4	2	66.7%	33.3%
4	Ceftriaxone (CRO)	6	0	100.0%	0.0%
5	Sulphamethoxazol + Trimethoprim(SXT)	0	6	0.0%	100.0%
6	Cephalothin (KF)	5	1	83.3%	16.7%
7	Ciprofloxacin (CIP)	3	3	50.0%	50.0%
8	Nitrofurantion (F)	2	4	33.3%	66.7%
9	Chloramphenicol (C)	3	3	50.0%	50.0%
10	Doxacycline "DO"	0	6	0.0%	100.0%
	Total	6			

Table 8 Shows antibiotic sensitivity/resistance pattern for isolated *Pseudomonas* from urine samples

	Antibiotic	Frequency		%	
		Sensitive	Resistance	Sensitive	Resistance
1	Ampicillin (AMP)	0	8	00.0%	100.0%
2	Amoxycillin (AMC)	0	8	00.0%	100.0%
3	Nalidixic acid (NA)	1	7	12.5%	87.5%
4	Ceftriaxone (CRO)	2	6	25.0%	75.0%
5	Sulphamethoxazol + Trimethoprim(SXT)	8	0	100.0%	0.0%
6	Cephalothin (KF)	0	8	0.0%	100.0%
7	Ciprofloxacin (CIP)	7	1	87.5%	12.5%
8	Nitrofurantion (F)	0	8	0.0%	100.0%
9	Chloramphenicol (C)	0	8	0.0%	100.0%
10	Doxacycline "DO"	1	7	12.5%	87.5%
	Total	8			

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Table 9 Shows antibiotic sensitivity/resistance pattern for isolated *Proteus spp* from urine samples

	Antibiotic	Frequency		%	
		Sensitive	Resistance	Sensitive	Resistance
1	Ampicillin (AMP)	0	12	00.0%	100.0%
2	Amoxycillin (AMC)	5	7	41.6%	58.4%
3	Nalidixic acid (NA)	6	6	50.0%	50.0%
4	Ceftriaxone (CRO)	8	4	66.6%	33.3%
5	Sulphamethoxazol + Trimethoprim(SXT)	6	6	50.0%	50.0%
6	Cephalothin (KF)	2	10	16.6%	83.4%
7	Ciprofloxacin (CIP)	9	3	75.0%	25.0%
8	Nitrofurantion (F)	8	4	66.6%	33.4%
9	Chloramphenicol (C)	5	7	41.6%	58.4%
10	Doxacycline "DO"	3	9	25.0%	75.0%
	Total	12			

Corynebacteria are Gram positive aerobic, non motile, non spore forming bacilli represent the lowest isolated cases in the study 4 (1.53%) from all isolated cases. Its pattern of antibiotic sensitivity was as follows: Ampicillin 75%, Amoxycillin 75%, Nalidixic acid 75%, Ceftriaxon 25%, Sulphamethoxazol + Trimethoprim 50%, Cephlothin 100%, Ciprofloxacillin 100%, Nitrofuranatian 100%, Chloramphenicol 0%, Doxacycline 75% (Table 10). After detection of antibiotic sensitivity/resistance patterns for every individual isolated pathogenic bacteria from urine samples (262). Table 11 is a crude table showing relationship between antibiotic sensitivity/resistance pattern for all isolated bacteria and number of cases. It shows the antibiotic sensitivity patterns for all isolated pathogenic bacteria as follows: Ampicillin 9.2%, Amoxycillin 70.2%, Nalidixic asid 60.3%, Ceftriaxon 61.8%, Sulphamethoxazol + Trimethoprim 26.3%, Cephlothin 35.5%, Ciprofloxacillin 80.2%, Nitrofuranatian 64.5%, Chloramphenicol 43.1%, Doxacycline 26.3%.

Table 10 Shows antibiotic sensitivity/resistance pattern for isolated *Corynebacteria* from urine samples

	Antibiotic	Frequency		%	
		Sensitive	Resistance	Sensitive	Resistance
1	Ampicillin (AMP)	3	1	75.0%	25.0%
2	Amoxycillin (AMC)	3	1	75.0%	25.0%
3	Nalidixic acid (NA)	3	1	75.0%	25.0%
4	Ceftriaxone (CRO)	1	3	25.0%	75.0%
5	Sulphamethoxazol + Trimethoprim(SXT)	2	2	50.0%	50.0%
6	Cephalothin (KF)	4	0	100.0%	0.0%
7	Ciprofloxacin (CIP)	4	0	100.0%	0.0%
8	Nitrofurantion (F)	4	0	100.0%	0.0%
9	Chloramphenicol (C)	0	4	0.0%	100.0%
10	Doxacycline "DO"	3	1	75.0%	25.0%
	Total	4			

Table 11 Shows antibiotic sensitivity/resistance patterns for all isolated pathogenic bacteria from urine samples

	Antibiotic	Frequency		%	
		Sensitive	Resistance	Sensitive	Resistance
1	Ampicillin (AMP)	24	238	9.2%	90.8%
2	Amoxycillin (AMC)	184	78	70.2%	29.8%
3	Nalidixic acid (NA)	158	104	60.3%	39.7%
4	Ceftriaxone (CRO)	162	100	61.8%	38.2%
5	Sulphamethoxazol + Trimethoprim(SXT)	69	193	26.3%	73.7%
6	Cephalothin (KF)	93	169	35.5%	64.5%
7	Ciprofloxacin (CIP)	210	52	80.2%	19.8%
8	Nitrofurantion (F)	169	93	64.5%	35.5%
9	Chloramphenicol (C)	113	149	43.1%	56.9%
10	Doxacycline "DO"	69	193	26.3%	73.7%
	Total	262			

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Discussion

This study indicates the following results:

I. Urinary tract infection is a major cause of morbidity especially in young children, 173 (66%) out of 262 cases showed positive growth on bacterial cultures, received during the four months period of study.

II. Trends in choice of antibiotic treatment may change depending on locally determined resistances, common pathogens and cost issues.

In El Batnan Medical Center, during 2003 and 2004 in the UTI patients we found that *E Coli* was the most common pathogen 40.46% (106/262), and was most sensitive to Ciprofloxacin (85.8%) with noticeable resistance to Ampicillin (90.6%resistance). *Klebsiella* was the second commonest pathogen 22.5% (59/262) against which Ciprofloxacin and Amoxicillin were most sensitive (71.2%) for both, with clear resistance to Ampicillin (100%) and Cephalothin (79.7%). *Staph epidermidis* was the third revealed pathogen 13.35% (35/262) against which Amoxycillin and Cephalothin (82.8%), (83.8%) respectively were most sensitive.

Staph aureus represented 12.21% (32/262) of cases, Nalidixic acid and, Ciprofloxacin were most sensitive 75% with clear resistance to Ampicillin (90.6%). *Enterococcus* 2.29% (6/262) of cases, Amoxycillin and Ceftriaxon were the most sensitive 100% while Doxacycline was resistance in all cases 100%. *Pseudomonas* 3.05% (8/262) of cases. Sulphamethoxazol + trimethoprim (Co-Trimoxazole) were most sensitive in all cases 100%, while Ampicillin, Amoxycillin, Cephalothin, Nitrofurantoin and Chloramphenicl were most resistance in all cases 100%. *Proteus* spp. represented 4.58% (12/262) of cases. Ciprofloxacin was sensitive in 75% of cases, while Ampicillin was resistant in all cases 100%. *Corynebacteri*a was the least common organism seen in UTIs 1.6 % of cases (4/262). Cephalothin, Ciprofloxacin and Nitrofurantian sensitivity were 100% in all cases, while Chloramphenicol was resistant in all cases 100%, Ceftriaxon was only sensitive in 75 % of cases.

III. The most sensitive antibiotics to all isolated bacteria were Ciprofloxacin 80.2% and Amoxycillin (70.2%), while Ampicillin was the least sensitive only in 9.2%, among all UTIs cases. Although many clinicians favour the use of Ampicillin or Co-amoxiclav believing it will have a higher 'hit rate', we concluded that we should be using less Ampicillin and Co-amoxiclav for empirical treatment. We recommended the use of more Ciprofloxacin for empirical treatment, with three day course or Ceftriaxone (in case of the parenteral route) [12,13]. Certain differences may change our treatment policies, such as effect of antibiotic side effects, particularly relating to renal function, altered antibiotic resistances compared to younger populations. Again, few studies addressing these issues exist, and decisions are made anecdotally.

IV. The following antibiotics are the most sensitive antibiotics in all UTIs cases, firstly, Ciprofloxacin 80.2%, Amoxicillin 70.2%, Nitrofurantion 64.5%, and Ceftriaxon 61%.

Conclusion

In the notable absence of studies in the treatment of uncomplicated UTI we recommend empirical antimicrobial treatment based on local sensitivities which should be changed once the local pattern of sensitivities is known.

Recommendations

Antibiotic therapy certain rules have to be applied:

i. Do not give antibiotic without good evidence of an infection treatable with the antibiotic.

ii. Stop the antibiotic after 5 days if the patient is better.

iii. Do not give large doses of powerful antibiotic or combination of antibiotic unless the patient is very sick, as it eliminates the normal microbial flora and lead to further infection.

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