



E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(1): 144-145
Received: 02-11-2018
Accepted: 04-12-2018

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Effect of xenobiotic antibiotics against UTI microbes

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Abstract

The urinary tract infections one of the important microbial infection which affecting the different age group of people. The analysis of antibacterial activity of commercial antibiotics against urinary tract infections of bacteria were determined. In the five UTI samples were collected from Thanjavur medical college and hospital, Thanjavur and isolated bacteria identified by using biochemical test and morphological observation were performed. The bacterial species isolated from urine samples were *Escherichia coli*, *Klebsiella pneumonia*, *Proteus* sp, *Pseudomonas* sp and *Staphylococcus aureus* was 5, 6, 8, 2 and 6 colonies recorded from the patients respectively. The antibiotic sensitivity of xenobiotic antibiotics like A-Ampicillin, S- Streptomycin, P- Penicillin, C- Chloramphenicol, E-Erythromycin, CIP- Ciprofloxacin, G- Gentamycin, and PB- Polymyxin-B against UTI bacteria were performed respectively. The maximum zone of inhibition of bacteria *Pseudomonas* sp, followed by *E.coli*, *Proteus* sp, *K.pneumoniae* and *Staphylococcus aureus* was observed and minimum zone of inhibition of bacteria *K.pneumoniae* recorded respectively. The important of xenobiotic antibiotics showed maximum antibacterial properties from urinary tract infections patients and detect the effectiveness of antibiotics against bacteria.

Keywords: Urinary tract infections, pathogen, antibiotic test

Introduction

Urinary tract infections are common problem in human beings. The UTI can lead to more serious consequence diseases including kidney problems. They are the second most common type of infection in the body (Stamm *et al.*, 2001) [6]. This problem occurs more often in women than men because a women's urethra and shorter. The short urethra makes it easier for bacteria from the path. Urine is ordinary an excellent culture medium for the multiplication of common pathogens of urinary tract. The commercial antibiotics has potential power with the inhibition of UTI bacteria and leads with all the problems were solved. The synthetic antibiotic production has highly sensitive activity against bacteria and high level of suppression of bacteria because of direct application of drugs delivery to the human system. According to the WHO recommended differentially deposited in the medium and analysis of several related factors with respective parameters of the urinary tract pathogens

Materials and Methods

Collection of Urine sample

Urine samples using sterile container were collected from patients from Thanjavur Medical College, Thanjavur. Collected samples were TMC, Thanjavur. From the selected dilutions. 0.1ml of samples were inoculated on Macconkey, Blood, Sabourad dextrose agar. The inoculated plates were then incubated at 37°C for 24 hours. After incubation, isolation of bacteria was performed using standard techniques (Koneman *et al.*, 2005) [4].

Isolation of bacteria from sample

Ten urine samples from UTI patients were collected from pathological laboratory. For the isolation of UTI causing strains, loop full of urine sample was streaked on to Nutrient agar and Mac Conkey agar plate and incubated at 37 C for 24hrs. Next day individual colonies were selected and identified on the basis of morphological, cultural and biochemical characteristics.

Identification of bacteria

The morphological characteristics, gram-staining, capsule staining and motility test were performed. The growth pattern, different media including Nutrient agar, MacConkey agar, Eosine Methylene Blue agar, Mannitol Salt agar, Citrimide agar, Bi.G.G.Y agar (Bismuth Glycine Glucose Yeast agar) and Blood agar base supplemented with 5% sheep blood were used. For biochemical characteristics, sugar fermentation (lactose, glucose, mannitol,

maltose, sucrose and xylose), TSI, IMViC (indole, MR, VP, citrate) oxidase, catalase and nitrate tests were performed. The identification of bacteria by Bergy's manual of determinative bacteriology, 12th edition (Holt *et al.*, 2016) [3].

Maintenance of clinical isolates

Stock cultures were maintained in vials on nutrient agar and stored at 4 C for further analysis.

Antibiotic sensitivity test (Sumera Sabir *et al.*, 2014) [7]

Antibiotic susceptibility testing was performed by the disc diffusion assay on Muller Hinton Agar by Kirby-Bauer method (Collee *et al.*, 1996) using the following antibiotics disc: A- Ampicillin, S- Streptomycin, P- Penicillin, C- Chloramphenicol, E-Erythromycin, CIP- Ciprofloxacin, G- Gentamycin, and PB- Polymyxin-B. Interpretation of diameter of growth inhibition zone was done by using the standard interpretative chart provided by disc manufacturer. At 37°C, after 24 hours of incubation, organisms were scored as sensitive or resistant to corresponding antibiotic on the basis of zone of inhibition following the criteria of clinical and laboratory standards institute.

Results and Discussion

In the current investigation suggested that the gain information about the type of pathogen responsible for urinary tract infection and evaluation of antimicrobial activity of various plant extract against the pathogens. From the three patients (TMCP1, TMCP2 and TMCP3) were selected and collection al sample nearly 27 total number of colonies (CFU/ml) were isolated. The name of the bacteria like *Escherichia coli*, *Klebsiella pneumonia*, *Proteus* sp, *Pseudomonassp* and *Staphylococcus aureus* were identified and conformed with help of Bergy's manual of determinative bacteriology (Ezeadila *et al.*, 2015) [2].

Priyadharshini, (2014) [5] studied that isolation, identification of microbial isolates from urinary tract infection patients and evaluation of antimicrobial activity using plant extracts (against *Staphylococcus aureus*, *S.epidermidis*, *Pseudomonas aeruginosa*, *Klebsiella pneumonia*, *Streptococcus* sp including *Candida albicans* were analysed (Table-1).

Table 1: Isolation of bacteria from diabetic patients

S. No	Name of the bacteria	Patient code	Total no.of colonies (CFU/ml)
1	<i>Escherichia coli</i>	TMCP1	5
2	<i>Klebsiella pneumonia</i>	TMCP1	6
3	<i>Proteus</i> sp	TMCP3	8
4	<i>Pseudomonassp</i>	TMCP1	2
5	<i>Staphylococcus aureus</i>	TMCP2	6
Total			27

The commercial antibiotic sensitivity tests were carried out against *E.coli*, *Proteussp*, *Pseudomonas* sp, *K.pneumoniae* and *Staphylococcus aureus* were determined. The commercial antibiotic of Ambicillin sensitivity disc was 3, 5, 2 and 7mm recorded zone of inhibition with *E.coli*, *Proteussp*, *Pseudomonassp*, *K.pneumoniae* whereas *Streptomycin* was 9mm *E.coli*, *Proteus* sp and 10mm in *Staphylococcus aureus* were performed. The Chloromphenol antibiotic was maximum performance against *E.coli* (10mm), *Proteus* sp (12mm), *Pseudomonassp* (25mm), *K.pneumoniae* (15mm) and *Staphylococcus aureus* (22mm) were analysed. According to the antibiotic disc activities of Erithromycin only in two bacteria *Proteussp* (15mm) and *Pseudomonassp*

(8mm) represented in invitro conditions. The specific test of Ciprosporin was *E.coli* (12mm), *K.pneumoniae* (7mm), *Proteussp* (15mm), *Pseudomonas* sp (13mm) and *Staphylococcus aureus* (15mm) sensitivity were measured. In the case of Gentamycin against *Pseudomonas* (17mm) more inhibition recorded respectively. In the polymerex antibiotic against *Proteussp* (10mm), *Pseudomonas* sp (8mm) and *Staphylococcus aureus* (5mm) observed from the sensitivity test. Among the tested antibiotic, the cepholesporin antibiotics was maximum extent performance against pathogens (Table-2)

Table 2: Antibiotic sensitivity test of isolates against UTI bacteria

S. No	Name of the bacteria	Antibiotic sensitivity disc (mm)							
		A	S	P	C	E	CIP	G	PB
1	<i>Escherichia coli</i>	3	4	6	10	-	12	-	-
2	<i>Klebsiella pneumoniae</i>	5	-	-	15	-	7	-	-
3	<i>Proteus</i> sp	2	2	-	22	15	15	-	10
4	<i>Pseudomonassp</i>	7	-	10	25	8	13	17	8
5	<i>Staphylococcus aureus</i>	-	10	-	22	-	15	-	5

The resistance exhibited by the isolates against some of the conventional antibiotic could be attributed to be ability of these organisms to observe some mechanisms to resistance of action of the antibiotics. The conventional antibiotics showed pronounced activities against the bacteria of which ciprofloxacin recorded the highest activity against bacteria. Therefore, a perioctic testing for UTI is advocated and those found to be infected need to be treated with antibiotics like ciprofloxacin to avoid complications.

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