

IN VITRO ANTIBACTERIAL ACTIVITY OF COMMONLY USED ANTIBIOTICS AGAINST URINARY TRACT ISOLATES

Pages with reference to book, From 154 To 155

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Abstract

Frequency of various organisms and their sensitivity pattern was studied in 79 patients with urinary tract infection. Seventyfive percent had E. Coli, 15% Proteus and 6.3% Pseudomonas infection. Furadantin was most effective against E. Coli and Tobramycin against Proteus infections. Tobramycin and Gentamycin were equally effective against Pseudomonas infection (JPMA 37 : 154, 1987).

INTRODUCTION

In urinary tract infection micro-organisms may be present only in the urine (bacteriuria). or there may be evidence of infection of an organ, urethritis, prostatitis, cystitis or pyelonephritis. Infection in any part of. the urinary tract may spread to any other part of the tract.

Virtually any organism introduced into the urinary tract may cause urinary tract infection however, in majority of cases especially escherichia coil (serotypes, 1,2,6,7,8,11,15) and pseudomonas. Other organisms (e.g. staphylococcus saprophyticus and strepto-coccus faecalis) occasionally appear.

MATERIALS AND METHODS

Seventy nine outdoor patients of either sex suffering from urinary tract infection were included in the study. Basal clean catch midstream specimens of urine were obtained in sterilized bottles. With one mm sterilized wire loop the urine samples were taken from uncentrifuged specimens and were streaked on Macconkey agar. The plates were kept in incubator at 37°C for 18-24 hours.

The number of colonies were counted and 50 or more colonies were considered as significant growth (more than 10^5 organisms/ml).

The inoculum was taken with the help of sterilized wire loop and transferred to nutrient broth. The broth suspension was poured into the sensitivity agar plate and about 7-8 different antibiotics impregnated discs were placed in each plate. The plates were incubated at 35°C for 18-24 hours.

The zone of inhibition for each antibiotic was measured in mm with the help of a ruler.

RESULTS

The causative micro-organisms in 79 cases of urinary tract infection were E. Coil (74.7%), Proteus (15.2%), Pseudomonas (6.3%) and Strep. faecalis (3.8%). Their sensitivity pattern is shown in Tables I, II and III.

TABLE I
Urinary isolate E. Coli and its Sensitivity Pattern.

Antibiotics	No. of cases	Resistant	Sensitive	Percentage
Furadantin	49	4	45	91.8%
Augmentin	32	3	29	90.0%
Tobramycin	42	7	35	83%
Gentamycin	25	6	19	76%
Norfloxacin	17	4	13	76%
Minocyclin	29	8	21	72%
Pipemidic acid	44	13	31	70%
Keflexin	51	18	33	65%
Amoxycillin	23	11	12	50%

TABLE II
Urinary tract Isolate Proteus and its Sensitivity Pattern.

Antibiotics	No. of Cases	Resistant	Sensitive	Percentage
Tobramycin	10	1	9	90.0%
Norfloxacin	8	1	7	87.5%
Pipemidic acid	9	2	7	77.7%
Augmentin	13	3	10	77.0%
Minocyclin	8	2	6	75.0%
Furadantin	10	3	7	70.0%

TABLE III
Urinary Tract Isolate Pseudomonas Aeruginosa
and its Sensitivity Pattern.

Antibiotics	No. of cases	Resistant	Sensitive	Percentage
Tobramycin	5	nil	5	100%
Gentamycin	5	nil	5	100%
Pipemidic acid	4	2	2	50%

Furadantin, Augmentin and Tobramycin were most effective in E. Coli, Tobramycin and Norfloxacin against Proteus and Gentamycin and Tobramycin against Pseudomonas infections.

DISCUSSION

It is well established that Escherichia coli is the commonest urinary tract pathogen² in this study too, E. Coli was the causative agent in 75% of the cases. The other organisms isolated were proteus, pseudomonas aeruginosa and streptococcus faecalis. All these patients were suffering from recurrent urinary tract infections.

In chronic and recurrent urinary tract infections, bacteriological help is essential for drug resistance is common and mixed infections occur. In this study cotrimaxazole was found to be the least effective against E. Coli, proteus and pseudomonas when compared to other antibiotics commonly used in urinary tract infection.

Nitrofurantoin, Augmentin, Tobramycin, Gentamycin and Norfloxacin were found to be the most active, Minocyclin and pipemidic acid moderately active and Keflexin Amoxycillin and Cotrimaxazole were least active against E. Coli. Tobramycin and Norfloxacin showed best activity against proteus. Augmentin, pipemidic acid and Minocyclin were also active against proteus group of organisms. Tobramycin and Gentamyciti were the only drugs effective against pseudomonas aeruginosa. Pipemidic acid also showed some activity against pseudomonas. The clear difference in antibacterial activity of Amoxycillin and augmentin is due to the synergistic effect of clavulanic acid. The clavulanic acid inhibits the enzymes, B lactamases³.

The present study indicates that, resistance to older antibiotics has developed through various mechanisms. Therefore the haphazard use of antibiotics should be discouraged. At present, it seems preferable, certainly from the point of discouraging resistance for patients with recurrent urinary infections, to receive under laboratory and medical supervision, appropriate and varying therapy for specific episodes of infection.

REFERENCES

1. Krupp, A. M., Chatton, J. M., Werdegar, D. Current medical diagnosis and treatment. Los Altos,

California, Lange, 1985.

2. Stamm, WE., Counts, G.W., Running , K.R., Fihns, S., Turck, M. and Holmes, K.K. Diagnosis of coliform infection in acutely dysuric women. N.Engl. J. Med., 1982; 307 :463.

3. Ninane, G., Joly, J., Kraytmàn, M. and Piot, P. Bronchopulmonary infection due to B-lactamase-producing Branhamella catarrhalis treated with amoxydilhin clavulanic acid. Lancet, 1978; 2:257.