Antibacterial Sensitivity Pattern in Urinary Tract Infection 1975-79

Pages with reference to book, From 69 To 71

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Abstract

Antibiotic sensitivity pattern of common causative organisms of urinary tract infection was studied during the period of January, 1975 to December, 1979. These patients were referred by practicing doctors from their clinics and various hospitals. Of 14778, urine samples 4720 (32%) yielded a growth of organisms more than 10^5/ml or between 10^4-10^5/ml. These isolates were identified and tested against the five antibacterial agents by disc diffusion technique (Gavan, 1971). A definite fall in the sensitivity of E. Coli and kiebsiella to Ampicillin was observed over a perjod of 4 years. jPMA 32:69, 1982).

Introduction

The prevalence of urinary tract infection (U.T.I.) is very high(Wing, 1970). Sixty per cent of the total cases referred for bacteriological investigations to our laboratory were those of U.T.I. This infection requires urgent and proper treatment. Most of the patients with U.T.I. are treated without laboratory investigations and their progress is monitored by the clinical response. If “Best Guess” for the primary choice of antibiotic is going to be applied rationally a knowledge of the causative organisms and their behavior against antioacterials is essential. This can only be achieved by the statistical studies of organisms and their sensitivity pattern. (Gruncberg, 1977; Mc Allister et. al, 1971). A widespread and indiscriminate use of broad spectrum antibiotic in common and severe bacterial infection results in the emergence of resistant strains in a very short time (Garrod, 1972).
This study was planned to assess the sensitivity pattern of U.T.1. pathogens to five highly potent antibiotics namely Ampicillin, Co-timoxazole, Nitrofurantoin, Gentamicin and Kanamycin during a period of the last five years.

Methods and Material

Mid Stream Urines were received preferably collected at the laboratoy or brought by the patients within an hour in sterile containers. It was plated on Blood agar and mac-conky’s agar with a standard loop. Viable bacterial count more than 10^5/ml or between 10^4-10^5/ml were selected for identificatien and antibiotic sensitivity tests.
Kirby Bauer Single disc agar diffusion method of susceptibility testing was done on pure culture. The medium used was Mueller Hinton agar (ph 7.4). Sixty Millilitre of the medium was poured into 14 cm diameter petridishes. Plates were dried for 30 minutes and used within 4 days. Five colonies of the organisms were picked up and seeded in 4 ml T.S. broth Trypticase Soya broth containing 1% yeast extract) and incubated for 4 hours at 37°C. The growth turbidity ws compared with barium sulphate standard (0.5 ml of 0.048M Ba Cl2 (1.17% Ba Cl_2 $2H_2O$) in 99.5 ml of 1% H_3 SO_4 V/V). The growth density was adjusted by adding sterile water. The organisms were streaked evenly on the medium in 3 directions using a cotton wool swab. After the inoculum was dried, usually within 15 minutes, nine individual disos were applied by the help of forecep. The plates were incubated overnight at 37°. According to the modified K.B. zone size interpretation chart for antibiotic sensitivity inhibition zone

diameters were measured with the help of a ruler. (Lynch-1976). The results of the study are shown in Tables I-V.

Table I

Yearwise distribution of male and female patients with urinary tract infection

Year	*Total Cases*	*Male*	*%*	*Female*	*%*
1975	2267	1007	44.4	1260	55.6
1976	2956	1301	44.0	1655	56.0
1977	3187	1080	33.9	2107	66.1
1978	3265	1060	32.5	2205	67.5
1979	3103	1100	35.4	2003	64.6
5 Years	14778	5548	38	9230	62

Table II

Distribution of Cases Positive Cases Male/Female Urinary Tract Infection.

Year	*Total Cases*	*Male*	%	*Feamle*	%
1975	903	417	46.2	486	53.8
1976	944	368	40.0	576	60.0
1977	913	372	40.7	541	59.3
1978	884	348	39.4	536	60.6
1979	1076	460	42.7	616	57.3
5 Years	4720	1965	41.6	2755	58.4

Table III

Organisms isolated from U.T.I. 1975-1979.

Organisms	1975		1976		1977		1978		1979		*Total*	
	No.	(%)	*No.*	(%)	*No.*	(%)	*No.*	(%)	*No.*	(%)	*No.*	(%)
Esch. coli.	519	(46.4)	612	(55.8)	633	(57.5)	604	(55.9)	694	(57.6)	3062	(55.6)
Proteus Spp.	70	(6.3)	51	(4.6)	60	(5.4)	37	(3.4)	52	(4.6)	270	(4.8)
Strep. faecalis.	73	(6.5)	88	(8.0)	82	(7.4)	64	(5.9)	74	(6.6)	381	(6.9)
Staph-aureus (Coag. Pos.)	251	(22.5)	193	(17.9)	205	(18.6)	178	(16.5)	197	(17.7)	1024	(18.6)
Klebsiella Spp.	45	(4.0)	91	(8.3)	50	(4.5)	90	(8.3)	92	(8.2)	468	(6.7)
Ps. aeruginosa.	162	(14.4)	61	(5.6)	72	(6.5)	107	(9.9)	96	(8.6)	498	(9.0)

Table IV

Comparative Sensitivities.

Years	*Amp.* %	*Co-Trimox* %	*Nif.* %	*Gent.* %	*Kan.* %
Esch. coli.					
1975	39	79	75	97	82
1976	23	78	77	93	78
1977	21	76	82	93	81
1978	19	75	82	90	74
1979	14	68	72	93	77
Proteus Spp.					
1975	50	70	12	97	78
1976	42	75	30	90	76
1977	35	73	43	90	78
1978	43	68	27	91	72
1979	40	78	23	94	81
Strept. faecalis					
1975	54	90	91	84	50
1976	71	93	87	64	47
1977	72	92	91	53	43
1978	90	92	89	56	42
1979	70	97	78	63	52
Staph-aureus. (Coag. Pos.)					
1975	65	87	92	94	85
1976	71	90	94	93	80
1977	77	93	94	94	78
1978	78	85	94	88	75
1979	66	94	97	96	82
Klebsiella Spp.					
1975	35	68	42	100	84
1976	13	66	54	94	74
1977	8	72	58	94	74
1978	6	63	62	96	73
1979	2	60	55	86	66

Table V

Disc Potency and Zone Size.
"KIRBY—BAUER"

Antibacterial	*Disc Potency*	*Resistant*
Ampicillin	10 mcg	11 mm or less
Co-trimoxazole	25 mcg	10 mm or less
Nitrofurantoin	300 mcg	14 mm or less
Gentamicin	10 mcg	13 mm or less
Kanamycin	30 mcg	13 mm or less

Discussion

The common pathogens of Urinary tract infection and their sensitivity pattern shown in table 4 points to slight and expected fall of sensitivity extended over a period of 4 years. The behavior of Escherichia coli and Kiebsiella Spp. against ampicillin should be seriously taken into consideration where the loss of sensitivity has been more marked. (Garrod, 1973).

Ampicillin is a semi synthetic penicillin belonging to the family of broad spectrum penicillins. It has a reputation of having least untoward effects and this has caused it to be used as the drug of first choice in medical practice even for minor illness. It is thought that almost all the Esch coli infection of Urinary tracts is an auto infection from the gut (Heather et at 1980). The Esch coli of the gut colonises at the preurethral area, from where ascending infection starts. Due to the indiscriminate use of Ampiciltin the gut Esch coli may be a resistant type of B-lactamase producers or R plasmid type which gives a high percentage of resistance. In view of this antibiotic resistance, sensitivity studies were done by us on 500 specimens of faeces which had no sign of bacterial infection i.e. no mucus, blood or pus cells. Esch coli thus isolated were tested for ampicillin sensitivity and only 25% were found to be sensitive (Unpublished data). The percentage Ampicillin sensitivity of faecal Esch coli run almost paralled to the Ampicillin sensitivity of Esch coli found in the U.T.I.

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