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IN VITRO ACTIVITY OF SEFTAZIDIME AGAINST CLINICAL ISOLATES

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Summary: In vitro activity of seftazidime was determined using an agar dilution technique against 596 clinical bacterial isolates. It was shown that seftazidime is highly active against Gram negative bacteria including Pseudomonas sp. and exerts poor activity against some Gram positive bacteria.

Key words: Bacterial isolates, in vitro activity, seftazidime

In recent years a number of broad spectrum antibiotics have been developed. Seftazidime is a new cephalosporine with a wide range of aminoglycosides against Pseudomonas aeruginosa in vitro is a well documanted phenomenon that has recognised in vivo advantages (1-4). This paper presents the in vitro antibacterial activities of seftazidime against local clinical isolates.

Material and Method

The activity of seftazidime was compared with Cefoperazone, Monobactam and Tobramycin against locally isolated microorganisms from clinical source. Antibiotic powders were obtained from their manufactures and standart solutions were prepared by weighing antibiotic powder into a known volume of water. Agar plates (Diagnostic sensitivity test agar, Oxoid) were made to contain concentration of antimicrobials as doubling dilutions in the range 1 to 128 mg/1. Overnight broth (Brain-heart infusion, Difco) cultures prepared from purity plates were diluted in saline that inocula of 10^6 cfu in 0.1 ml. Eight different cultures were inoculated onto a 100 mm diameter plate and incubated for 12 h in a suitable atmosphere before being read by eye. The minimal inhibitory concentration (MIC) was taken as the lowest concentration showing no growth or a markedly reduced growth in colony numbers or size, as compared to growth on an antibiotic free control plate.

Results and Discussion

In vitro activity of seftazidime was determined using an agar dilution technique with inocula of 10^6 cfu against 596 clinical bacterial isolates and evaluated in comparison with cefaperazone, monobactam and tobramycin. Susceptibility to antibiotics was determined by antibacterial activity and proved to be highly active against Gram negative bacteria including Salmonella and Shigella sps, E.coli, Proteus sp, Citrobacter sp, Klebsiella sp, Pseudomonas sp, and Enterobacter sp with MICs being <1 to 8 mg/1, which are usually resistant to cefoperazone and tobramycin (Table I).

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Table I. In vitro activity of seyftazidime, cefoperazone, monobactam and tobramycin against gram-negative bacteria

Organisims (no.of strains tested)	Antibiotics	MIC mg/1 with an inoculum of 10^6 cfu MIC $_{90}$
Citrobacter sp	Seftazidime	1
15	Cefoperazone	8
	Monobactam	1
	Tobramycin	16
Enterobacter sp	Seftazidime	8
81	Cefoperazone	64
	Monobactam	4
	Tobramycin	32
Escherichia coli	Seftazidime	<1
76	Cefoperazone	8
	Monobactam	1
	Tobramycin	2
Klebsiella sp	Seftazidime	1
20	Cefoperazone	32
	Monobactam	<1
	Tobramycin	16
Proteus sp	Seftazidime	1
72	Cefoperazone	32
	Monobactam	1
	Tobramycin	8
Pseudomonas sp	Seftazidime	4
91	Cefoperazone	128
	Monobactam	16
	Tobramycin	128
Salmonella sp	Seftazidime	<1
45	Cefoperazone	1
	Monobactam	<1
	Tobramycin	<1
Shigella sp	Seftazidime	<1
32	Cefoperazone	1
	Monobactam	<1
	Tobramycin	2

A high degree of activity was also demonstrated against the beta lactamase producing and non-producing strains of some Gram positive cocci (Table II).

Table II. In vitro activity of seftazidime, cefoperazone, monobactam, and tobramycin against gram-positivi bacteria

Organisims (no.of strains tested)	Antibiotics	MIC mg/l with an Inoculum of 10^6 cfu MIC $_{90}$
Staphylococcus aureus 35	Seftadizime	32
	Cefoperazone	8
	Monobactam	128
	Tobramycin	4
Staphylococcus epidermidis 47	Seftadizime	16
	Cefoperazone	16
	Monobactam	>128
	Tobramycin	16
Streptococcus pyogenes 14	Seftazidime	8
	Cefoperazone	1
	Monobactam	64
	Tobramycin	4
Streptococcus pneumonia 50	Seftazidime	4
	Cefoperazone	<1
	Monobactam	16
	Tobramycin	1
Streptococcus faecalis 18	Seftazidime	>128
	Cefoperazone	8
	Monobactam	>128
	Tobramycin	16

MIC90: Minimal inhibitory concentration for 90 % of the strains.

Seftazidime showed poor activity against Streptococcus faecalis and moderate activity against Staphylococcus aureus. Its activity was markedly greater than cefoperazone and tobramycin, and was equal to or higher than that of monobactam against enterobacteriaceae.

Seftazidime is a higly active, and a beta-lactamase-stable agent which may be clinically useful in resistant bacterial infections and its anti-pseudomonal activity is encouraging.

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