

Introduction

Spectinomycin is an aminocyclitol compound with structural similarity to streptomycin, but differs from aminoglycosides in that it is not an amino sugar. It is currently available as the dihydrochloride salt.

While spectinomycin has potentially useful activity against some Gram-positive and Gram-negative bacteria, its clinical use is restricted to the treatment of gonorrhoea. Spectinomycin inhibits protein synthesis by binding to the 30s ribosomal subunit. High level (MIC ≥ 512 mg/L) resistance to spectinomycin mainly results from single step chromosomal mutation affecting the ribosomal structure of *Neisseria gonorrhoeae*.

1. Dosage

	BSAC	CA-SFM	CRG	DIN	NWGA	SRGA
Most common dose	2g x 1	2g x 1	2g x 1	2g x 1	2g x 1	2g x 1
Maximum dose schedule	4g x 1	4g x 1	4g x 1	4g x 1	4g x 1	4g x 1
Available formulations	im	im	im	im	im	im

2. MIC distributions and epidemiological cut-off (ECOFF) values

	0.002	0.004	0.008	0.016	0.032	0.064	0.125	0.25	0.5	1	2	4	8	16	32	64	128	256	512	ECOFF
<i>Escherichia coli</i>	0	0	0	0	0	0	0	0	0	0	0	7	132	2071	342	200	357	581	0	64
<i>Mannheimia haemolytica</i>	0	0	0	0	0	0	0	0	0	0	0	0	45	96	4	0	1	1	0	ND
<i>Neisseria gonorrhoeae</i>	0	0	0	0	0	1	0	5	0	1	1	60	812	1433	552	61	10	0	0	64
<i>Pasteurella multocida</i>	0	0	0	0	0	0	0	0	0	0	0	8	28	88	29	0	1	6	0	ND
<i>Salmonella</i> spp	0	0	0	0	0	0	0	0	0	0	0	1	3	1442	7836	857	158	2158	1	ND
<i>Serratia</i> spp.	0	0	0	0	0	0	0	0	0	0	0	1	22	275	320	21	1	20	0	ND
<i>Staphylococcus aureus</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	97	19	0	4	128
<i>Staphylococcus haemolyticus</i>	0	0	0	0	0	0	0	0	1	1	5	2	1	0	0	0	0	0	0	ND
<i>Staphylococcus hominis</i>	0	0	0	0	0	0	0	0	0	4	35	74	7	2	1	6	1	0	0	ND
<i>Staphylococcus hyicus</i>	0	0	0	0	0	0	0	0	0	0	0	0	1	0	41	130	4	0	38	ND
<i>Staphylococcus warnerii</i>	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	ND

The table includes MIC distributions available at the time breakpoints were set. They represent combined distributions from multiple sources and time periods. The distributions are used to define the epidemiological cut-offs (ECOFF) and give an indication of the MICs for organisms with acquired or mutational resistance mechanisms. They should not be used to infer resistance rates. When there is insufficient evidence (IE) no epidemiological cut-off has been determined.

3. Breakpoints prior to harmonisation (mg/L) S ≤ R >

	BSAC	CA-SFM	CRG	DIN	NWGA	SRGA	CLSI
General breakpoint							
Enterobacteriaceae							
<i>Pseudomonas</i> spp.							
<i>Acinetobacter</i> spp.							
<i>Staphylococcus</i> spp.							
<i>Streptococcus</i> spp.							
<i>S. pneumoniae</i>							
<i>Enterococcus</i> spp.							
<i>Haemophilus/Moraxella</i> spp.							
Corynebacteria							
<i>N. meningitidis</i>							
<i>N. gonorrhoeae</i>	64/64	64/64			32/32	32/32	32/64
<i>P. multocida</i>							
Anaerobes, Gram-positive							
Anaerobes, Gram-negative							
<i>Campylobacter</i> spp.							
<i>Helicobacter pylori</i>							

4. Pharmacokinetics

Dosage (mg)	2000			
Cmax (mg/L)	100			
Cmin (mg/L)	<1			
Total body clearance (L/h)				
T $\frac{1}{2}$ (h), mean (range)	1.5 – 2			
AUC24h (mg.h/L)				
Fraction unbound (%)				
Volume of distribution (L/kg)				
Comments	<ul style="list-style-type: none">• Two values are given where references differ. Cells are left empty when data are not readily available.			
References	<ul style="list-style-type: none">• Wagner JG et al. <i>Int J Clin Pharmacol</i> 1968; 1: 261.			

5. Pharmacodynamics

fAUC/MIC for bacteriostasis				
fAUC/MIC for 2 log reduction				
fAUC/MIC from clinical data				
Comments	<ul style="list-style-type: none">No data available			
References				

6. Monte Carlo simulations and Pk/Pd breakpoints

No data available.

7. Clinical data

The bacteriological and clinical efficacy of spectinomycin has been evaluated in several trials involving patients with gonorrhoea. These data support the efficacy of spectinomycin in therapy of infections caused by wild type *Neisseria gonorrhoeae*.

8. Clinical breakpoints

Non-species-related breakpoints	In the absence of pharmacodynamic data and the limited clinical use of spectinomycin, no non-species specific breakpoint can be given.
Species-related breakpoints	<i>Neisseria gonorrhoeae</i> 64/64 mg/L. This breakpoint is essentially an epidemiological cut-off which correlates with clinical outcome. There is no evidence that a higher dose permits treatment of infections caused by isolates with MICs >64mg/L so an intermediate category is not given.
Species without breakpoints	As the only indication is treatment of gonorrhoea no other organisms have been given breakpoints.
Clinical qualifications	The only indication is treatment of gonorrhoea.
Dosage	Breakpoints apply to a single intramuscular spectinomycin dose of 2g.
Additional comment	

9. Spectinomycin - EUCAST clinical MIC breakpoints

These can be found at <http://www.eucast.org>

10. Exceptions noted for individual national committees
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None
