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Comparative *In Vitro* Activities of Torezolid (DA-7157) against Clinical Isolates of Aerobic and Anaerobic Bacteria in South Korea[▽]

Jong Hwa Yum,[1] Sung Hak Choi,[2,3] Dongeun Yong,[4] Yunsop Chong,[4] Weon Bin Im,[2] Dong-Kwon Rhee,[3] and Kyungwon Lee[4]*

Department of Clinical Laboratory Science, Dong-eui University, Busan, South Korea[1]; Research Laboratory, Dong-A Pharmaceutical Co., Ltd., Yongin, South Korea[2]; College of Pharmacy, Sungkyunkwan University, Suwon, South Korea[3]; and Department of Laboratory Medicine and Research Institute of Bacterial Resistance, Yonsei University College of Medicine, Seoul, South Korea[4]

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Resistance of Gram-positive pathogens to first-line antimicrobial agents has been increasing in many parts of the world. We compared the *in vitro* activities of torezolid with those of other antimicrobial agents, including linezolid, against clinical isolates of major aerobic and anaerobic bacteria. Torezolid had an MIC_{90} of ≤0.5 μg/ml for the Gram-positive bacterial isolates tested and was more potent than either linezolid or vancomycin.

Antimicrobial resistance in Gram-positive cocci has become a major problem in recent years. Oxazolidinones, a new therapeutic class of synthetic drugs, are active against Gram-positive pathogens. Linezolid, the only marketed oxazolidinone, inhibits the initiation of bacterial protein translation by binding to the 23S rRNA peptidyl transferase region (15). The widely used drug linezolid is effective against most Gram-positive pathogens, including methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant *Enterococcus* spp., and penicillin-resistant *Streptococcus pneumoniae* (1, 2). However, several recent studies have reported the emergence of linezolid-resistant staphylococci and enterococci in Brazil, China, France, Germany, Italy, and Sweden. The dominant resistance mechanisms are mutations of the 23S rRNA gene and the recently described mobile chloramphenicol-florfenicol resistance (*cfr*) methyltransferase gene (9).

The antibacterial activity of oxazolidinones depends on their affinity for the site of action on the ribosome. Therefore, by modifying their chemical structure, novel oxazolidinones with improved antimicrobial activity can be obtained. Accordingly, it is important to find more useful and less toxic oxazolidinones. Torezolid [TR-700, DA-7157; R-3-(4-(2-(2-methyltetrazol-5-yl)pyridine-5-yl)-3-fluorophenyl)-5-hydroxymethyl oxazolidin-2-on] is the active moiety of the prodrug torezolid phosphate (TR-701, DA-7218) (Fig. 1). In a recent study, torezolid was 4- to 8-fold more active than linezolid against Gram-positive bacteria collected from the United States (3). In another study, torezolid demonstrated an 8- to 16-fold increase in potency against all of the linezolid-resistant isolates tested, including MRSA, MRSA carrying the mobile *cfr* methyltransferase gene, and vancomycin-resistant enterococci (14). However, as far as we know, the activities of torezolid against anaerobic bacteria have not been reported.

Human plasma protein binding of torezolid was about 80% (data not shown), and the MIC was unaffected by the presence of 20% human plasma (4). Torezolid has a better pharmacokinetic profile than linezolid. After oral administration of torezolid at 200 mg once a day, the maximum concentration of the drug in serum, half-life, and area under the curve were 2.0 μg/ml, 11.2 h, and 25.4 μg · h/ml, respectively (13). In another study, torezolid phosphate was safe and effective with once-daily 200-mg dosing over 5 to 7 days of treatment for severe complicated skin and skin structure infections caused by Gram-positive bacteria (16). In this study, we compared the *in vitro* activities of torezolid with those of other antimicrobial agents, including linezolid, against clinical isolates of major aerobic and anaerobic Gram-positive and Gram-negative bacteria.

(Part of this study was presented at the 44th Interscience Conference on Antimicrobial Agents and Chemotherapy, Washington, DC, 2004 [12]).

Five hundred ten nonduplicate aerobic and anaerobic bacterial isolates were collected between 2002 and 2004 from patients at a South Korean tertiary-care hospital. The species were identified by conventional methods or by using either the ID 32 GN or the ATB 32A system (bioMérieux, Marcy-l'Etoile, France). Antimicrobial susceptibility was tested by the CLSI agar dilution method (5, 6, 7). The media used were Mueller-Hinton agar (Becton Dickinson, Sparks, MD) for testing of *Staphylococcus* spp., *Enterococcus* spp., and *Moraxella catarrhalis*; Mueller-Hinton agar supplemented with 5% sheep blood for *Streptococcus* spp.; Haemophilus test medium for

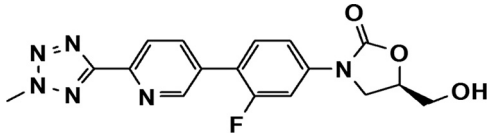

FIG. 1. Chemical structure of torezolid.

* Corresponding author. Mailing address: Department of Laboratory Medicine, Yonsei University College of Medicine, 250 Seongsanro, Seodaemunku, Seoul 120-752, South Korea. Phone: 82-2-2228-2446. Fax: 82-2-313-0908. E-mail: leekcp@yuhs.ac.
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TABLE 1. Comparative antimicrobial activities of torezolid and other antimicrobial agents against aerobic and anaerobic bacteria

Organism (no. of isolates tested) and antimicrobial agent	Breakpoint (μg/ml)[f]			MIC (μg/ml)			Susceptibility (%)[f]		
	S	I	R	Range	50%	90%	S	I	R
Methicillin-susceptible *S. aureus* (30)									
Torezolid	NA[g]	NA	NA	0.5–1	0.5	0.5	NA	NA	NA
Linezolid	≤4		≥8	2–4	4	4	100	NA	0
Erythromycin	≤0.5	1–4	≥8	0.5–>128	0.5	>128	63	7	30
Clindamycin	≤0.5	1–2	≥4	≤0.06–1	0.25	0.25	97	3	0
Cotrimoxazole	≤2/38		≥4/76	≤0.06–32	0.25	2	90	NA	10
Gentamicin	≤4	8	≥16	0.06–>128	0.5	128	70	3	27
Levofloxacin	≤1	2	≥4	0.5–8	0.5	1	97	0	3
Tetracycline	≤4	8	≥16	0.25–64	0.5	32	83	0	17
Oxacillin	≤2		≥4	0.06–0.5	0.5	0.5	100	NA	0
Vancomycin	≤2	4–8	≥16	0.5–1	0.5	1	100	0	0
MRSA (30)									
Torezolid	NA	NA	NA	0.5	0.5	0.5	NA	NA	NA
Linezolid	≤4		≥8	2–4	2	4	100	NA	0
Erythromycin	≤0.5	1–4	≥8	0.5–>128	>128	>128	3	3	93
Clindamycin	≤0.5	1–2	≥4	0.25–>128	>128	>128	17	0	83
Cotrimoxazole	≤2/38		≥4/76	0.25–>128	0.5	>128	73	NA	27
Gentamicin	≤4	8	≥16	0.25–>128	64	>128	13	0	87
Levofloxacin	≤1	2	≥4	0.5–>128	16	>128	17	0	83
Tetracycline	≤4	8	≥16	0.5–128	64	64	33	0	67
Oxacillin	≤2		≥4	32–>128	>128	>128	0	NA	100
Vancomycin	≤2	4–8	≥16	0.5–2	1	1	100	0	0
Methicillin-susceptible, coagulase negative staphylococci (29)									
Torezolid	NA	NA	NA	0.25–0.5	0.5	0.5	NA	NA	NA
Linezolid	≤4		≥8	1–4	2	4	100	NA	0
Erythromycin	≤0.5	1–4	≥8	0.25–>128	0.5	128	76	0	24
Clindamycin	≤0.5	1–2	≥4	0.12–>128	0.25	1	90	7	3
Cotrimoxazole	≤2/38		≥4/76	≤0.06–32	0.25	16	90	NA	10
Gentamicin	≤4	8	≥16	0.06–128	0.12	64	69	7	24
Levofloxacin	≤1	2	≥4	0.25–32	0.5	0.5	97	0	3
Tetracycline	≤4	8	≥16	0.5–128	0.5	32	76	0	24
Oxacillin	≤0.25		≥0.5	0.06–0.25	0.12	0.25	100	NA	0
Vancomycin	≤2	4–8	≥16	0.5–2	1	1	100	0	0
Methicillin-resistant, coagulase negative staphylococci (26)									
Torezolid	NA	NA	NA	0.12–0.5	0.5	0.5	NA	NA	NA
Linezolid	≤4		≥8	0.5–4	2	2	100	NA	0
Erythromycin	≤0.5	1–4	≥8	≤0.06–>128	64	128	42	0	58
Clindamycin	≤0.5	1–2	≥4	0.12–>128	0.25	>128	62	0	38
Cotrimoxazole	≤2/38		≥4/76	≤0.06–32	2	32	50	NA	50
Gentamicin	≤4	8	≥16	0.06–128	16	64	27	15	58
Levofloxacin	≤1	2	≥4	0.12–16	0.5	16	73	12	15
Tetracycline	≤4	8	≥16	0.5–>128	4	128	69	4	27
Oxacillin	≤0.25		≥0.5	0.5–>128	4	64	0	NA	100
Vancomycin	≤2	4–8	≥16	0.25–2	1	2	100	0	0
Vancomycin-susceptible *Enterococcus faecalis* (49)									
Torezolid	NA	NA	NA	0.12–0.5	0.25	0.5	NA	NA	NA
Linezolid	≤2	4	≥8	0.5–2	2	2	100	0	0
Ampicillin	≤8		≥16	0.25–8	1	4	100	NA	0
Erythromycin	≤0.5	1–4	≥8	0.12–>128	4	>128	9	42	49
Levofloxacin	≤2	4	≥8	0.5–64	2	64	69	0	31
Tetracycline	≤4	8	≥16	0.5–128	64	64	20	0	80
Vancomycin	≤4	8–16	≥32	1–4	2	2	100	0	0
Teicoplanin	≤8	16	≥32	≤0.12–0.5	0.25	0.5	100	0	0
Vancomycin-resistant *E. faecalis* (12)									
Torezolid	NA	NA	NA	0.25–0.5	0.25	0.5	NA	NA	NA
Linezolid	≤2	4	≥8	0.5–1	1	1	100	0	0
Ampicillin	≤8		≥16	1–4	2	4	100	NA	0
Erythromycin	≤0.5	1–4	≥8	>128	>128	>128	0	0	100

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TABLE 1—*Continued*

Organism (no. of isolates tested) and antimicrobial agent	Breakpoint (μg/ml)[f]			MIC (μg/ml)			Susceptibility (%)[f]		
	S	I	R	Range	50%	90%	S	I	R
Levofloxacin	≤2	4	≥8	16–128	64	64	0	0	100
Tetracycline	≤4	8	≥16	0.5–64	32	64	8	0	92
Vancomycin	≤4	8–16	≥32	>128	>128	>128	0	0	100
Teicoplanin	≤8	16	≥32	32–128	64	64	0	0	100
Vancomycin-susceptible *Enterococcus faecium* (30)									
Torezolid	NA	NA	NA	0.06–0.25	0.25	0.25	NA	NA	NA
Linezolid	≤2	4	≥8	0.5–2	2	2	100	0	0
Ampicillin	≤8		≥16	1–>128	>128	>128	7	NA	93
Erythromycin	≤0.5	1–4	≥8	0.25–>128	>128	>128	3	7	90
Levofloxacin	≤2	4	≥8	2–128	64	64	3	7	90
Tetracycline	≤4	8	≥16	0.12–32	0.5	1	97	0	3
Vancomycin	≤4	8–16	≥32	0.5–4	0.5	0.5	100	0	0
Teicoplanin	≤8	16	≥32	0.25–2	0.5	0.5	100	0	0
Vancomycin-resistant *E. faecium* (29)									
Torezolid	NA	NA	NA	0.06–0.25	0.12	0.25	NA	NA	NA
Linezolid	≤2	4	≥8	0.5–1	1	1	100	0	0
Ampicillin	≤8		≥16	64–>128	>128	>128	0	NA	100
Erythromycin	≤0.5	1–4	≥8	64–>128	128	>128	0	0	100
Levofloxacin	≤2	4	≥8	16–128	64	128	0	0	100
Tetracycline	≤4	8	≥16	≤0.06–128	0.25	128	90	0	10
Vancomycin	≤4	8–16	≥32	64–>128	128	>128	0	0	100
Teicoplanin	≤8	16	≥32	2–64	16	64	21	31	48
S. pneumoniae (29)									
Torezolid	NA	NA	NA	0.12–0.5	0.25	0.25	NA	NA	NA
Linezolid	≤2			0.5–2	1	1	100	NA	NA
Penicillin G	≤0.06		≥0.12	0.015–2	1	2	17	NA	83
Cefotaxime[c]	≤0.5	1	≥2	0.015–2	1	2	31	55	14
Clindamycin	≤0.25	0.5	≥1	0.25–>128	>128	>128	28	0	72
Erythromycin	≤0.25	0.5	≥1	0.25–>128	>128	>128	14	0	86
Cotrimoxazole	≤0.5/9.5	1/19–2/38	≥4/76	0.5–128	16	64	24	10	66
Levofloxacin	≤2	4	≥8	1–2	2	2	100	0	0
Tetracycline	≤2	4	≥8	≤0.12–32	16	32	10	0	90
S. pyogenes (15)									
Torezolid	NA	NA	NA	0.06–0.25	0.12	0.25	NA	NA	NA
Linezolid	≤2			1–2	1	2	100	NA	NA
Penicillin G	≤0.12			≤0.008–0.015	0.015	0.015	100	NA	NA
Cefotaxime	≤0.5			≤0.008–0.03	0.015	0.03	100	NA	NA
Clindamycin	≤0.25	0.5	≥1	0.12–0.25	0.12	0.25	100	0	0
Erythromycin	≤0.25	0.5	≥1	0.12–0.25	0.12	0.25	100	0	0
Levofloxacin	≤2	4	≥8	0.5–4	1	4	80	20	0
S. agalactiae (15)									
Torezolid	NA	NA	NA	0.12–0.5	0.25	0.5	NA	NA	NA
Linezolid	≤2			1–2	2	2	100	NA	NA
Penicillin G	≤0.12			0.03–0.06	0.06	0.06	100	NA	NA
Cefotaxime	≤0.5			0.03–0.06	0.06	0.06	100	NA	NA
Clindamycin	≤0.25	0.5	≥1	0.25–>128	0.25	>128	53	0	47
Erythromycin	≤0.25	0.5	≥1	0.25–>128	0.5	>128	13	47	40
Levofloxacin	≤2	4	≥8	1–2	1	2	100	0	0
M. catarrhalis (27)									
Torezolid	NA	NA	NA	0.5–2	1	1	NA	NA	NA
Linezolid	NA	NA	NA	2–8	4	4	NA	NA	NA
Penicillin G	NA	NA	NA	0.03–32	16	32	NA	NA	NA
Cefaclor	≤8	16	≥32	0.25–32	2	8	96	0	4
Clindamycin	≤0.5	1–2	≥4	1–4	2	4	0	59	41
Erythromycin	≤0.5	1–4	≥8	0.12–0.5	0.25	0.5	100	0	0
Levofloxacin	≤2			0.06	0.06	0.06	100	NA	NA
Tetracycline	≤2	4	≥8	0.25–16	0.5	0.5	96	0	4

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TABLE 1—*Continued*

Organism (no. of isolates tested) and antimicrobial agent	Breakpoint (μg/ml)[f]			MIC (μg/ml)			Susceptibility (%)[f]		
	S	I	R	Range	50%	90%	S	I	R
H. influenzae (25)									
Torezolid	NA	NA	NA	2–16	2	4	NA	NA	NA
Linezolid	NA	NA	NA	4–16	8	16	NA	NA	NA
Ampicillin	≤1	2	≥4	0.5–>128	>128	>128	16	8	76
Ampicillin-sulbactam	≤2/1		≥4/2	0.5–8	4	8	36	NA	64
Cefaclor	≤8	16	≥32	2–>128	4	>128	60	0	40
Cefuroxime	≤4	8	≥16	0.25–>128	1	>128	80	4	16
Cefotaxime	≤2			≤0.008–0.5	0.03	0.5	100	NA	NA
Azithromycin	≤4			2–4	4	4	100	NA	NA
Cotrimoxazole	≤0.5/9.5	1/19–2/38	≥4/76	≤0.06–32	4	32	48	0	52
Levofloxacin	≤2			0.015–0.5	0.03	0.06	100	NA	NA
Tetracycline	≤2	4	≥8	0.25–32	0.5	8	84	4	12
Peptostreptococcus spp. (59)[a]									
Torezolid	NA	NA	NA	0.03–0.25	0.06	0.25	NA	NA	NA
Linezolid	NA	NA	NA	0.25–2	0.5	1	NA	NA	NA
Ampicillin	≤0.5	1	≥2	≤0.06–16	0.12	1	90	2	8
Ampicillin-sulbactam	≤8/4	16/8	≥32/16	≤0.06–8	0.12	1	100	0	0
Piperacillin	≤32	64	≥128	≤0.06–16	≤0.06	8	100	0	0
Piperacillin-tazobactam	≤32/4	64/4	≥128/4	≤0.06–16	≤0.06	8	100	0	0
Cefoxitin	≤16	32	≥64	≤0.06–16	0.25	4	100	0	0
Cefotetan	≤16	32	≥64	≤0.06–128	0.5	16	92	2	7
Imipenem	≤4	8	≥16	≤0.06–1	≤0.06	0.12	100	0	0
Clindamycin	≤2	4	≥8	≤0.06–>128	0.5	64	80	0	20
Metronidazole	≤8	16	≥32	≤0.06–4	1	2	100	0	0
Vancomycin	NA	NA	NA	≤0.12–1	0.25	0.5	NA	NA	NA
Clostridium perfringens (15)									
Torezolid	NA	NA	NA	0.12–0.25	0.25	0.25	NA	NA	NA
Linezolid	NA	NA	NA	1–2	2	2	NA	NA	NA
Ampicillin	≤0.5	1	≥2	≤0.06–0.5	≤0.06	0.12	100	0	0
Ampicillin-sulbactam	≤8/4	16/8	≥32/16	≤0.06–0.5	≤0.06	0.25	100	0	0
Piperacillin	≤32	64	≥128	≤0.06–1	≤0.06	0.25	100	0	0
Piperacillin-tazobactam	≤32/4	64/4	≥128/4	≤0.06	≤0.06	≤0.06	100	0	0
Cefoxitin	≤16	32	≥64	0.25–1	0.5	1	100	0	0
Cefotetan	≤16	32	≥64	≤0.06–0.5	≤0.06	0.12	100	0	0
Imipenem	≤4	8	≥16	≤0.06–0.12	≤0.06	≤0.06	100	0	0
Clindamycin	≤2	4	≥8	≤0.06–2	1	2	100	0	0
Metronidazole	≤8	16	≥32	1–4	4	4	100	0	0
Vancomycin	NA	NA	NA	0.5–2	0.5	0.5	NA	NA	NA
Other *Clostridium* spp. (15)[b]									
Torezolid	NA	NA	NA	≤0.06–0.25	0.25	0.25	NA	NA	NA
Linezolid	NA	NA	NA	0.5–4	2	4	NA	NA	NA
Ampicillin	≤0.5	1	≥2	≤0.06–1	0.25	1	87	13	0
Ampicillin-sulbactam	≤8/4	16/8	≥32/16	≤0.06–2	0.25	1	100	0	0
Piperacillin	≤32	64	≥128	≤0.06–16	1	8	100	0	0
Piperacillin-tazobactam	≤32/4	64/4	≥128/4	≤0.06–16	1	8	100	0	0
Cefoxitin	≤16	32	≥64	0.25–128	8	64	60	0	40
Cefotetan	≤16	32	≥64	≤0.06–>128	2	>128	53	7	40
Imipenem	≤4	8	≥16	≤0.06–4	1	4	100	0	0
Clindamycin	≤2	4	≥8	≤0.06–>128	1	>128	53	13	33
Metronidazole	≤8	16	≥32	0.12–16	4	8	93	7	0
Vancomycin	NA	NA	NA	0.25–8	4	8	NA	NA	NA
Other anaerobic Gram-positive bacilli (13)[c]									
Torezolid	NA	NA	NA	0.06–0.5	0.06	0.5	NA	NA	NA
Linezolid	NA	NA	NA	≤0.06–4	0.5	2	NA	NA	NA
Ampicillin	≤0.5	1	≥2	≤0.06–2	≤0.06	1	85	8	8
Ampicillin-sulbactam	≤8/4	16/8	≥32/16	≤0.06–2	0.12	1	100	0	0
Piperacillin	≤32	64	≥128	≤0.06–8	0.5	8	100	0	0
Piperacillin-tazobactam	≤32/4	64/4	≥128/4	≤0.06–8	≤0.06	8	100	0	0
Cefoxitin	≤16	32	≥64	≤0.06–>128	1	>128	100	0	0
Cefotetan	≤16	32	≥64	0.12–>128	4	>128	62	8	31
Imipenem	≤4	8	≥16	≤0.06–2	0.12	2	100	0	0

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TABLE 1—*Continued*

Organism (no. of isolates tested) and antimicrobial agent	Breakpoint (μg/ml)[f]			MIC (μg/ml)			Susceptibility (%)[f]		
	S	I	R	Range	50%	90%	S	I	R
Clindamycin	≤2	4	≥8	≤0.06–4	≤0.06	2	92	8	0
Metronidazole	≤8	16	≥32	0.25–>128	>128	>128	38	8	54
Vancomycin	NA	NA	NA	0.25–>32	0.5	>32	NA	NA	NA
B. fragilis (30)									
Torezolid	NA	NA	NA	1–4	2	2	NA	NA	NA
Linezolid	NA	NA	NA	2–4	4	4	NA	NA	NA
Ampicillin	≤0.5	1	≥2	16–>128	32	>128	0	0	100
Ampicillin-sulbactam	≤8/4	16/8	≥32/16	1–32	2	16	83	7	10
Piperacillin	≤32	64	≥128	4–>256	32	256	53	17	30
Piperacillin-tazobactam	≤32/4	64/4	≥128/4	0.12–8	0.25	1	100	0	0
Cefoxitin	≤16	32	≥64	4–64	8	32	87	7	7
Cefotetan	≤16	32	≥64	4–128	8	32	83	7	10
Imipenem	≤4	8	≥16	≤0.06–4	0.25	1	100	0	0
Clindamycin	≤2	4	≥8	≤0.06–>128	128	>128	43	0	57
Metronidazole	≤8	16	≥32	0.5–8	4	4	100	0	0
B. thetaiotaomicron (15)									
Torezolid	NA	NA	NA	1–2	2	2	NA	NA	NA
Linezolid	NA	NA	NA	4	4	4	NA	NA	NA
Ampicillin	≤0.5	1	≥2	16–>128	32	>128	0	0	100
Ampicillin-sulbactam	≤8/4	16/8	≥32/16	1–32	1	32	73	13	13
Piperacillin	≤32	64	≥128	16–>256	32	>256	73	0	27
Piperacillin-tazobactam	≤32/4	64/4	≥128/4	2–16	4	8	100	0	0
Cefoxitin	≤16	32	≥64	16–32	16	32	73	27	0
Cefotetan	≤16	32	≥64	32–>128	128	>128	0	13	87
Imipenem	≤4	8	≥16	0.12–2	0.25	2	100	0	0
Clindamycin	≤2	4	≥8	2–>128	8	>128	7	40	53
Metronidazole	≤8	16	≥32	2–4	4	4	100	0	0
Other *Bacteroides* spp. (14)[d]									
Torezolid	NA	NA	NA	1–4	1	2	NA	NA	NA
Linezolid	NA	NA	NA	1–4	2	4	NA	NA	NA
Ampicillin	≤0.5	1	≥2	2–>128	>128	>128	0	0	100
Ampicillin-sulbactam	≤8/4	16/8	≥32/16	1–32	8	32	57	29	14
Piperacillin	≤32	64	≥128	2–>256	64	>256	43	14	43
Piperacillin-tazobactam	≤32/4	64/4	≥128/4	2–16	4	8	100	0	0
Cefoxitin	≤16	32	≥64	4–64	16	32	79.	14	7
Cefotetan	≤16	32	≥64	4–>128	64	>128	29	14	57
Imipenem	≤4	8	≥16	≤0.06–2	0.5	1	100	0	0
Clindamycin	≤2	4	≥8	4–>128	>128	>128	0	7	93
Metronidazole	≤8	16	≥32	≤0.25–4	4	4	100	0	0
Other anaerobic Gram-negative rods (27)[e]									
Torezolid	NA	NA	NA	0.03–4	0.25	2	NA	NA	NA
Linezolid	NA	NA	NA	≤0.12–8	1	4	NA	NA	NA
Ampicillin	≤0.5	1	≥2	≤0.03–128	1	64	22	33	44
Ampicillin-sulbactam	≤8/4	16/8	≥32/16	≤0.03–4	1	4	100	0	0
Piperacillin	≤32	64	≥128	≤0.06–128	4	32	93	4	4
Piperacillin-tazobactam	≤32/4	64/4	≥128/4	≤0.06–8	≤0.06	4	100	0	0
Cefoxitin	≤16	32	≥64	≤0.06–8	1	4	100	0	0
Cefotetan	≤16	32	≥64	≤0.06–32	2	16	93	7	0
Imipenem	≤4	8	≥16	≤0.06–1	≤0.06	1	100	0	0
Clindamycin	≤2	4	≥8	≤0.06–>128	≤0.06	64	78	7	15
Metronidazole	≤8	16	≥32	≤0.06–4	0.5	4	100	0	0
Chloramphenicol	≤8	16	≥32	0.5–8	2	4	100	0	0

[a] *Finegoldia magna* (19 strains), *Peptoniphilus asaccharolyticus* (15 strains), *Peptostreptococcus anaerobius* (12 strains), *Peptostreptococcus micros* (7 strains), and *Anaerococcus prevotii* (6 strains).

[b] *Clostridium clostridiiforme* (3 strains), *C. sordellii* (1 strain), *C. innocuum* (5 strains), *C. tertium* (2 strains), *C. ramosum* (2 strains), *C. sporogenes* (1 strain), and *C. bifermentans* (1 strain).

[c] *Bifidobacterium adolescentis* (2 strains), *Propionibacterium acnes* (4 strains), *Eubacterium lentum* (3 strains), *Lactobacillus acidophilus* (2 strains), and *Actinomyces* sp. (2 strains).

[d] *Bacteroides distasonis* (5 strains), *B. vulgatus* (7 strains), and *B. ovatus* (2 strains).

[e] *Prevotella bivia* (6 strains), *P. buccae* (3 strains), *P. intermedia* (4 strains), *P. oralis* (2 strains), *Fusobacterium mortiferum* (3 strains), *F. necrophorum* (2 strains), *F. varium* (6 strains), and *Fusobacterium* sp. (1 strain).

[f] S, susceptible; I, intermediate; R, resistant.

[g] NA, not applicable.

Haemophilus influenzae; and brucella agar (Becton Dickinson) supplemented with 5 μg hemin, 1 μg vitamin K_1 per ml, and 5% laked sheep blood for anaerobic bacteria.

The antimicrobial agents used were torezolid and linezolid (Dong-A, Seoul, South Korea); erythromycin, tetracycline, oxacillin, penicillin G, and cefuroxime (Sigma Chemical, St. Louis, MO); piperacillin and tazobactam (Yuhan, Seoul, South Korea); azithromycin and sulbactam (Pfizer Korea, Seoul, South Korea); clindamycin (Korea Upjohn, Seoul, South Korea); levofloxacin (Daiichi, Tokyo, Japan); ampicillin, gentamicin, and chloramphenicol (Chong Kun Dang, Seoul, South Korea); cefotaxime (Han-Dok, Seoul, South Korea); cefoxitin and imipenem (Merck Sharp & Dohme, Rahway, NJ); cefotetan (Je Il, Seoul, South Korea); metronidazole (Choong Wae, Seoul, South Korea); trimethoprim and sulfamethoxazole (Dong Wha, Seoul, South Korea); cefaclor and vancomycin (Daewoong, Seoul, South Korea); and teicoplanin (Sanofi Aventis, Bridgewater, NJ).

American Type Culture Collection strains of *S. aureus* (ATCC 29213), *Enterococcus faecalis* (ATCC 29212), *S. pneumoniae* (ATCC 49619), *H. influenzae* (ATCC 49247), *Bacteroides fragilis* (ATCC 25285), and *Bacteroides thetaiotaomicron* (ATCC 29741) were used as reference strains. The meningeal breakpoints of penicillin G and cefotaxime were used for *S. pneumoniae*.

MRSA continues to be prevalent in South Korea, accounting for 64% of the *S. aureus* strains in one study (10). In this study, all of the isolates of staphylococci tested were inhibited by torezolid at ≤1 μg/ml and the MIC for 90% of the strains tested (MIC_{90}) was 4- to 8-fold lower than that of linezolid (Table 1). The majority of the MRSA isolates was resistant to erythromycin, clindamycin, gentamicin, levofloxacin, and tetracycline.

Vancomycin-resistant *Enterococcus faecium* has become prevalent in the United States (18). The vancomycin resistance rate of *E. faecium* has been 20% or higher in South Korean hospitals since 2003 (10). The MIC ranges of torezolid were 0.06 to 0.25 μg/ml for all of the enterococci, including vancomycin-resistant ones, while those of linezolid were 0.5 to 2 μg/ml (Table 1), which are similar to prior reports (8, 17). All of the isolates were susceptible to linezolid.

Penicillin-nonsusceptible *S. pneumoniae* strains were very prevalent (69%) in South Korean hospitals in 2007, when the meningeal breakpoint was applied. In this study, most of the pneumococcal isolates tested were nonsusceptible to penicillin G or cefotaxime, but the MIC range of torezolid was 0.12 to 0.5 μg/ml and the MIC_{90} was 4-fold lower than that of linezolid (Table 1). All of the isolates of *Streptococcus pyogenes* and *Streptococcus agalactiae* were inhibited by torezolid at ≤0.5 μg/ml.

β-Lactamase-producing *M. catarrhalis* and *H. influenzae* were prevalent in South Korea (11). The MIC ranges of torezolid for *M. catarrhalis* and *H. influenzae* were 0.5 to 2 and 2 to 16 μg/ml, respectively. The MIC_{90}s for both of these organisms were 4-fold lower than those of linezolid.

Intraabdominal and soft-tissue infections are often due to aerobic and anaerobic bacteria. Torezolid had excellent activity against Gram-positive anaerobes (Table 1). All of the peptostreptococci and anaerobic Gram-positive bacilli were inhibited by torezolid at ≤0.5 μg/ml, and the MIC_{90}s for these organisms were 4- to 16-fold lower than those of linezolid. The MIC_{90} of torezolid, 2 μg/ml, for anaerobic Gram-negative bacilli, was slightly lower than that of linezolid, 4 μg/ml (Table 1).

In conclusion, torezolid is a new antimicrobial agent with high *in vitro* activity against common aerobic and anaerobic Gram-positive bacteria, including multidrug-resistant isolates. Further studies are warranted to determine the clinical utility of torezolid as a therapeutic agent.

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