ANTIMICROBIAL AGENTS AND CHEMOTHERAPY, Mar. 2003, p. 1143–1147 Vol. 47, No. 3
0066-4804/03/$08.00+0 DOI: 10.1128/AAC.47.3.1143–1147.2003

Antianaerobe Activity of RBX 7644 (Ranbezolid), a New Oxazolidinone, Compared with Those of Eight Other Agents

Lois M. Ednie,[1] Ashok Rattan,[2] Michael R. Jacobs,[3] and P. C. Appelbaum[1]*

Department of Pathology, Hershey Medical Center, Hershey, Pennsylvania 17033[1]; Ranbaxy Research Laboratories, New Delhi, India[2]; and Department of Pathology, Case Western Reserve University, Cleveland, Ohio 44106[3]

Received 4 October 2002/Returned for modification 2 December 2002/Accepted 18 December 2002

The activity of ranbezolid (RBX 7644), a new oxazolidinone, against 306 anaerobes was compared with those of 11 other agents. The MICs at which 50% of the isolates tested are inhibited and those at which 90% of the isolates tested are inhibited (in micrograms per milliliter) were as follows: ranbezolid, 0.03 and 0.5; linezolid, 2 and 4; vancomycin, >16 and >16; teicoplanin, 1 and >16; quinupristin-dalfopristin, 1 and >8; amoxicillin-clavulanate, 0.5 and 2; imipenem, 0.125 and 1; clindamycin, 0.25 and 8; metronidazole, 1 and 4; gatifloxacin, 0.5 and 4; and moxifloxacin, 0.5 and 2, respectively. Ranbezolid had very good in vitro activity against both gram-negative and -positive anaerobes.

Anaerobes are frequent causes of human infections, e.g., intra-abdominal infections, especially in immunocompromised and otherwise debilitated hosts. β-lactamase production is found in most of the *Bacteroides fragilis* group and has increasingly been found in *Prevotella*, *Porphyromonas*, and *Fusobacterium* spp. Clindamycin resistance is found in the *B. fragilis* group and some *Clostridium* strains, and metronidazole resistance, common among anaerobic gram-positive non-spore-forming rods, has also been found in the *B. fragilis* group (1–4).

Oxazolidinones are a new class of synthetic antimicrobial agents active mainly against gram-positive organisms, including gram-positive anaerobes such as *Clostridium* spp., *Peptostreptococcus* spp., and *Propionibacterium acnes*. Linezolid, the oxazolidinone for which most data are currently available, is active against staphylococci, streptococci, enterococci, and aerobic gram-positive non-spore-forming rods as well as gram-positive anaerobes. Activity against gram-negative organisms is less marked. Similar MICs have been described for AZD2563, another experimental oxazolidinone (5, 7, 8, 10, 13).

Ranbezolid (RBX 7644; Ranbaxy Research Laboratories, New Delhi, India) (Fig. 1) is a new oxazolidinone with enhanced activity against gram-positive organisms and activity against some fastidious gram-negative organisms. The present study examines the in vitro activity of ranbezolid in comparison with those of linezolid, vancomycin, teicoplanin, quinupristin-dalfopristin, amoxicillin, amoxicillin-clavulanate, imipenem, clindamycin, metronidazole, gatifloxacin, and moxifloxacin against 306 gram-positive and gram-negative anaerobes.

The strains were all clinical isolates, most of which were isolated during the past 3 years, mostly from the Hershey Medical Center, Hershey, Pa., but also from other hospitals, and were identified by conventional methodology (12). Each *Clostridium difficile* isolate was from a separate patient, with some patients from the Hershey Medical Center and others from different hospitals. The possibility of clonality (leading to similar susceptibilities) cannot be excluded in all cases. Prior to testing, organisms were stored in double-strength skim milk (Difco Laboratories, Detroit, Mich.) at −70°C. Purity throughout the study was checked by Gram stain and colonial morphology. Ranbezolid powder was obtained from Ranbaxy Research Laboratories, and other drugs were obtained from their respective manufacturers. Agar dilution testing for MICs was performed according to NCCLS methodology (11) by using *Brucella* laked blood agar plates and an inoculum of 10^5 CFU/spot. Plates were incubated for 48 h in an anaerobic chamber (Coy Laboratory Products, Ann Arbor, Mich.). Standard quality control strains were included in each run.

The MICs are presented in Table 1. As can be seen, the MICs of ranbezolid for gram-negative and -positive strains were lower than those of linezolid, with the ranbezolid MICs at which 50% (MIC_{50}) and 90% (MIC_{90}) of the isolates tested are inhibited being 0.03 and 0.5 μg/ml, respectively, compared with linezolid values of 2.0 and 4.0 μg/ml, respectively. The only organisms for which ranbezolid MICs were >0.5 μg/ml were *Fusobacterium varium* (1.0 μg/ml) and the anaerobic gram-positive rods, particularly lactobacilli and *Propionibacterium acnes* (2.0 to 4.0 μg/ml). For all other anaerobes, ranbezolid MICs ranged between ≤0.008 and 0.5 μg/ml. By contrast, linezolid yielded MICs of <1.0 μg/ml mainly against gram-positive anaerobes, with higher MICs against gram-negative anaerobes.

Quinupristin-dalfopristin, vancomycin, and teicoplanin were active predominantly against gram-positive species. Teicopla-

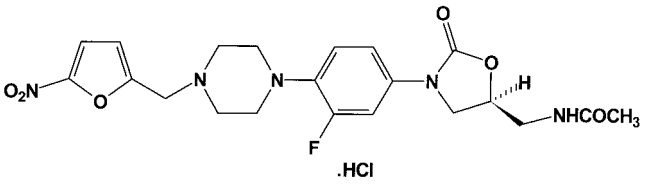

FIG. 1. Chemical structure of ranbezolid.

* Corresponding author. Mailing address: Department of Pathology, HO83, Penn State Hershey Medical Center, 500 University Dr., Hershey, PA 17033. Phone: (717) 531-5113. Fax: (717) 531-7953. E-mail: pappelbaum@psu.edu.

TABLE 1. MICs (micrograms per milliliter) of agents

Organism(s) (no. of strains) and agent	MIC range	MIC_{50}	MIC_{90}
Bacteroides fragilis (26)			
Ranbezolid	≤0.008–0.125	0.06	0.125
Linezolid	0.5–4.0	4.0	4.0
Quinupristin-dalfopristin	2.0–>8.0	8.0	>8.0
Amoxicillin	4.0–>128.0	32.0	>128.0
Amoxicillin-clavulanate	0.25–8.0	1.0	4.0
Clindamycin	0.06–>32.0	1.0	2.0
Metronidazole	0.25–2.0	1.0	1.0
Vancomycin	>16.0	>16.0	>16.0
Teicoplanin	16.0–>16.0	>16.0	>16.0
Imipenem	0.06–4.0	0.125	1.0
Gatifloxacin	0.5–>16.0	1.0	4.0
Moxifloxacin	0.25–>16.0	0.5	2.0
Bacteroides thetaiotaomicron (12)			
Ranbezolid	0.06–0.125	0.06	0.125
Linezolid	4.0	4.0	4.0
Quinupristin-dalfopristin	>8.0	>8.0	>8.0
Amoxicillin	16.0–>128.0	32.0	>128.0
Amoxicillin-clavulanate	0.5–8.0	1.0	8.0
Clindamycin	0.25–>32.0	4.0	>32.0
Metronidazole	0.5–2.0	1.0	1.0
Vancomycin	>16.0	>16.0	>16.0
Teicoplanin	>16.0	>16.0	>16.0
Imipenem	0.125–0.5	0.25	0.5
Gatifloxacin	1.0–>16.0	1.0	2.0
Moxifloxacin	1.0–>16.0	1.0	2.0
Bacteroides distasonis (12)			
Ranbezolid	0.06–0.125	0.06	0.125
Linezolid	4.0	4.0	4.0
Quinupristin-dalfopristin	8.0–>8.0	>8.0	>8.0
Amoxicillin	2.0–>128.0	2.0	>128.0
Amoxicillin-clavulanate	1.0–32.0	2.0	8.0
Clindamycin	0.03–>32.0	4.0	8.0
Metronidazole	0.5–2.0	1.0	1.0
Vancomycin	>16.0	>16.0	>16.0
Teicoplanin	16.0–>16.0	16.0	>16.0
Imipenem	0.03–1.0	0.5	1.0
Gatifloxacin	0.25–2.0	1.0	1.0
Moxifloxacin	0.25–1.0	0.5	0.5
Bacteroides vulgatus (11)			
Ranbezolid	≤0.008–0.06	0.016	0.016
Linezolid	2.0–4.0	2.0	2.0
Quinupristin-dalfopristin	2.0–>8.0	4.0	8.0
Amoxicillin	8.0–>128.0	16.0	>128.0
Amoxicillin-clavulanate	0.5–8.0	0.5	8.0
Clindamycin	≤0.016–>32.0	0.125	0.5
Metronidazole	≤0.125–1.0	0.5	1.0
Vancomycin	>16.0	>16.0	>16.0
Teicoplanin	>16.0	>16.0	>16.0
Imipenem	0.125–1.0	0.5	1.0
Gatifloxacin	0.25–16.0	1.0	16.0
Moxifloxacin	0.5–16.0	1.0	16.0
Bacteroides ovatus (10)			
Ranbezolid	0.03–0.25	0.06	0.125
Linezolid	2.0–4.0	4.0	4.0
Quinupristin-dalfopristin	8.0–>8.0	8.0	>8.0
Amoxicillin	16.0–>128.0	32.0	>128.0
Amoxicillin-clavulanate	0.5–4.0	0.5	2.0
Clindamycin	1.0–>32.0	2.0	>32.0
Metronidazole	0.5–2.0	1.0	2.0
Vancomycin	>16.0	>16.0	>16.0
Teicoplanin	>16.0	>16.0	>16.0
Imipenem	0.125–0.5	0.125	0.25
Gatifloxacin	1.0–16.0	2.0	2.0
Moxifloxacin	1.0–16.0	2.0	2.0
Bacteroides uniformis (4)			
Ranbezolid	0.016–0.125		
Linezolid	2.0–4.0		
Quinupristin-dalfopristin	4.0–8.0		
Amoxicillin	16.0–>128.0		
Amoxicillin-clavulanate	0.5–16.0		
Clindamycin	0.5–4.0		
Metronidazole	0.5		
Vancomycin	>16.0		
Teicoplanin	>16.0		
Imipenem	0.25–0.5		
Gatifloxacin	1.0–2.0		
Moxifloxacin	1.0–2.0		
All *Bacteroides fragilis* group (75)			
Ranbezolid	≤0.008–0.25	0.06	0.125
Linezolid	0.5–4.0	4.0	4.0
Quinupristin-dalfopristin	2.0–>8.0	>8.0	>8.0
Amoxicillin	2.0–>128.0	32.0	>128.0
Amoxicillin-clavulanate	0.25–32.0	1.0	8.0
Clindamycin	≤0.016–>32.0	1.0	>32.0
Metronidazole	≤0.125–2.0	1.0	1.0
Vancomycin	>16.0	>16.0	>16.0
Teicoplanin	16.0–>16.0	>16.0	>16.0
Imipenem	0.03–4.0	0.25	1.0
Gatifloxacin	0.25–>16.0	1.0	8.0
Moxifloxacin	0.25–>16.0	1.0	8.0
Prevotella bivia (11)			
Ranbezolid	0.125–0.5	0.25	0.5
Linezolid	1.0–4.0	2.0	4.0
Quinupristin-dalfopristin	2.0–8.0	4.0	8.0
Amoxicillin	≤0.125–128.0	4.0	64.0
Amoxicillin-clavulanate	≤0.125–4.0	0.25	2.0
Clindamycin	≤0.016–>32.0	≤0.016	>32.0
Metronidazole	1.0–4.0	2.0	4.0
Vancomycin	>16.0	>16.0	>16.0
Teicoplanin	1.0–4.0	2.0	2.0
Imipenem	≤0.016–0.06	0.03	0.06
Gatifloxacin	2.0–8.0	2.0	4.0
Moxifloxacin	2.0–8.0	2.0	4.0
Prevotella intermedia (10)			
Ranbezolid	≤0.008–0.03	0.016	0.03
Linezolid	0.5–1.0	1.0	1.0
Quinupristin-dalfopristin	0.25–2.0	0.5	0.5
Amoxicillin	≤0.125–8.0	1.0	8.0
Amoxicillin-clavulanate	≤0.125–0.25	≤0.125	0.25
Clindamycin	≤0.016–32.0	≤0.016	≤0.016
Metronidazole	≤0.125–1.0	0.25	0.5
Vancomycin	>16.0	>16.0	>16.0
Teicoplanin	0.125–2.0	0.5	1.0
Imipenem	≤0.016–0.06	≤0.016	0.03
Gatifloxacin	0.25–2.0	0.25	0.25
Moxifloxacin	0.5–4.0	0.5	0.5
Prevotella melaninogenica (10)			
Ranbezolid	0.03–0.125	0.06	0.125
Linezolid	1.0–2.0	2.0	2.0
Quinupristin-dalfopristin	1.0–4.0	2.0	4.0
Amoxicillin	≤0.125–128.0	32.0	64.0
Amoxicillin-clavulanate	≤0.125–2.0	1.0	2.0
Clindamycin	≤0.016–0.03	≤0.016	0.03

Continued on following page

TABLE 1—*Continued*

Organism(s) (no. of strains) and agent	MIC range	MIC_{50}	MIC_{90}
Metronidazole	0.25–1.0	0.25	0.5
Vancomycin	>16.0	>16.0	>16.0
Teicoplanin	1.0–4.0	2.0	4.0
Imipenem	≤0.016–0.125	0.03	0.125
Gatifloxacin	0.5–8.0	0.5	8.0
Moxifloxacin	0.5–16.0	1.0	16.0
Miscellaneous *Prevotella and Porphyromonas* species (26)[a]			
Ranbezolid	≤0.008–0.25	0.03	0.125
Linezolid	0.25–2.0	1.0	2.0
Quinupristin-dalfopristin	≤0.0125–4.0	1.0	2.0
Amoxicillin	≤0.0125–64.0	≤0.125	32.0
Amoxicillin-clavulanate	≤0.0125–2.0	≤0.125	0.5
Clindamycin	≤0.016–>32.0	≤0.016	≤0.016
Metronidazole	≤0.125–2.0	1.0	2.0
Vancomycin	1.0–>16.0	>16.0	>16.0
Teicoplanin	≤0.06–>16.0	2.0	16.0
Imipenem	≤0.016–0.125	0.03	0.06
Gatifloxacin	0.06–2.0	0.25	0.5
Moxifloxacin	0.03–2.0	0.5	0.5
All *Prevotella* and *Porphyromonas* spp. (57)			
Ranbezolid	≤0.008–0.5	0.06	0.25
Linezolid	0.25–4.0	2.0	2.0
Quinupristin-dalfopristin	≤0.125–8.0	2.0	4.0
Amoxicillin	≤0.125–128.0	4.0	64.0
Amoxicillin-clavulanate	≤0.125–4.0	0.25	2.0
Clindamycin	≤0.016–>32.0	≤0.016	32.0
Metronidazole	≤0.125–4.0	1.0	2.0
Vancomycin	1.0–>16.0	>16.0	>16.0
Teicoplanin	≤0.06–>16.0	2.0	8.0
Imipenem	≤0.016–0.125	0.03	0.06
Gatifloxacin	0.06–8.0	0.25	4.0
Moxifloxacin	0.03–16.0	0.5	4.0
Fusobacterium nucleatum (11)			
Ranbezolid	≤0.008–0.03	0.016	0.03
Linezolid	0.5–4.0	0.5	1.0
Quinupristin-dalfopristin	1.0–8.0	2.0	4.0
Amoxicillin	≤0.125–1.0	≤0.125	0.25
Amoxicillin-clavulanate	≤0.125–1.0	≤0.125	0.25
Clindamycin	0.06–0.125	0.06	0.06
Metronidazole	≤0.125–0.5	≤0.125	0.5
Vancomycin	>16.0	>16.0	>16.0
Teicoplanin	>16.0	>16.0	>16.0
Imipenem	≤0.016–0.06	0.03	0.06
Gatifloxacin	0.25–1.0	0.5	0.5
Moxifloxacin	0.125–0.5	0.25	0.25
Fusobacterium necrophorum (3)			
Ranbezolid	≤0.008–0.016		
Linezolid	0.25–0.5		
Quinupristin-dalfopristin	0.25–1.0		
Amoxicillin	≤0.125–0.5		
Amoxicillin-clavulanate	≤0.125–0.5		
Clindamycin	0.03		
Metronidazole	≤0.125–0.25		
Vancomycin	>16.0		
Teicoplanin	>16.0		
Imipenem	≤0.0016–0.25		
Gatifloxacin	0.5		
Moxifloxacin	1.0–2.0		
Fusobacterium mortiferum (11)			
Ranbezolid	0.03–0.125	0.03	0.06
Linezolid	0.25–0.5	0.25	0.5
Quinupristin-dalfopristin	4.0–>8.0	8.0	>8.0
Amoxicillin	1.0–>128.0	1.0	128.0
Amoxicillin-clavulanate	1.0–32.0	1.0	8.0
Clindamycin	0.06–0.25	0.06	0.125
Metronidazole	≤0.125–0.5	≤0.125	0.5
Vancomycin	>16.0	>16.0	>16.0
Teicoplanin	>16.0	>16.0	>16.0
Imipenem	0.25–1.0	0.5	1.0
Gatifloxacin	0.25–1.0	0.5	1.0
Moxifloxacin	0.25–1.0	0.5	1.0
Fusobacterium varium (11)			
Ranbezolid	0.25–1.0	0.5	1.0
Linezolid	1.0–2.0	1.0	2.0
Quinupristin-dalfopristin	>8.0	>8.0	>8.0
Amoxicillin	1.0–2.0	2.0	2.0
Amoxicillin-clavulanate	1.0–2.0	1.0	2.0
Clindamycin	1.0–>32.0	8.0	32.0
Metronidazole	≤0.125–1.0	0.25	0.25
Vancomycin	>16.0	>16.0	>16.0
Teicoplanin	>16.0	>16.0	>16.0
Imipenem	0.5–1.0	1.0	1.0
Gatifloxacin	2.0–>16.0	4.0	4.0
Moxifloxacin	2.0–>16.0	4.0	4.0
All *Fusobacterium* spp. (36)			
Ranbezolid	≤0.008–1.0	0.03	1.0
Linezolid	0.25–4.0	0.5	1.0
Quinupristin-dalfopristin	0.25–>8.0	8.0	>8.0
Amoxicillin	≤0.125–>128	1.0	2.0
Amoxicillin-clavulanate	≤0.125–32.0	1.0	2.0
Clindamycin	0.03–>32.0	0.06	16.0
Metronidazole	≤0.125–1.0	≤0.125	0.5
Vancomycin	>16.0	>16.0	>16.0
Teicoplanin	>16.0	>16.0	>16.0
Imipenem	≤0.016–1.0	0.5	1.0
Gatifloxacin	0.25–>16.0	0.5	4.0
Moxifloxacin	0.125–>16.0	0.5	4.0
Peptostreptococcus spp. (52)[b]			
Ranbezolid	≤0.008–0.03	≤0.008	0.016
Linezolid	0.5–2.0	1.0	2.0
Quinupristin-dalfopristin	≤0.125–2.0	0.5	1.0
Amoxicillin	≤0.125–32.0	≤0.125	0.5
Amoxicillin-clavulanate	≤0.125–32.0	≤0.125	0.5
Clindamycin	≤0.0016–>32.0	0.25	1.0
Metronidazole	≤0.125–2.0	0.5	2.0
Vancomycin	0.125–1.0	0.5	1.0
Teicoplanin	≤0.006–0.25	0.125	0.125
Imipenem	≤0.016–2.0	0.06	0.125
Gatifloxacin	0.125–16.0	0.5	2.0
Moxifloxacin	0.06–16.0	0.25	2.0
Propionibacterium acnes (11)			
Ranbezolid	1.0–2.0	1.0	2.0
Linezolid	0.5	0.6	0.5
Quinupristin-dalfopristin	≤0.125	≤0.125	≤0.125
Amoxicillin	≤0.125–0.25	≤0.125	0.25
Amoxicillin-clavulanate	≤0.125–0.25	≤0.125	0.25
Clindamycin	0.06	0.06	0.06
Metronidazole	>16.0	>16.0	>16.0
Vancomycin	0.5–1.0	0.5	1.0
Teicoplanin	0.25–0.5	0.25	0.25
Imipenem	≤0.016–0.03	≤0.016	0.03
Gatifloxacin	0.125–0.25	0.25	0.25
Moxifloxacin	0.125–0.25	0.25	0.25

Continued on following page

TABLE 1—*Continued*

Organism(s) (no. of strains) and agent	MIC range	MIC_{50}	MIC_{90}
Actinomyces spp. (6)			
Ranbezolid	≤0.008–1.0	0.03	
Linezolid	0.25–8.0	0.5	
Quinupristin-dalfopristin	≤0.125–0.5	≤0.125	
Amoxicillin	≤0.125–0.5	0.25	
Amoxicillin-clavulanate	≤0.125–0.5	0.25	
Clindamycin	0.03–4.0	0.03	
Metronidazole	1.0–>16	>16	
Vancomycin	0.5–8.0	1.0	
Teicoplanin	≤0.06–0.5	0.125	
Imipenem	0.03–0.25	0.125	
Gatifloxacin	0.5–4.0	2.0	
Moxifloxacin	0.5–4.0	2.0	
Bifidobacterium spp. (8)			
Ranbezolid	≤0.008–1.0	0.125	
Linezolid	0.125–1.0	0.5	
Quinupristin-dalfopristin	≤0.125	≤0.125	
Amoxicillin	≤0.125–0.5	0.25	
Amoxicillin-clavulanate	≤0.125–0.5	0.25	
Clindamycin	≤0.016–>32.0	0.03	
Metronidazole	2.0–>16.0	>16	
Vancomycin	0.25–1.0	0.5	
Teicoplanin	≤0.06–0.5	0.125	
Imipenem	≤0.016–0.5	0.06	
Gatifloxacin	0.25–2.0	0.5	
Moxifloxacin	0.25–1.0	0.5	
Eubacterium spp. (8)			
Ranbezolid	≤0.008–0.016	≤0.008	
Linezolid	1.0–2.0	1.0	
Quinupristin-dalfopristin	0.25–0.5	0.25	
Amoxicillin	1.0	1.0	
Amoxicillin-clavulanate	1.0	1.0	
Clindamycin	0.06–0.25	0.25	
Metronidazole	≤0.125–0.5	0.5	
Vancomycin	1.0–2.0	1.0	
Teicoplanin	≤0.06–0.125	0.125	
Imipenem	0.25–0.5	0.5	
Gatifloxacin	0.25–0.5	0.25	
Moxifloxacin	0.25–0.5	0.5	
Lactobacillus spp. (8)			
Ranbezolid	0.03–4.0	4.0	
Linezolid	0.5–8.0	4.0	
Quinupristin-dalfopristin	0.25–2.0	2.0	
Amoxicillin	0.5–2.0	1.0	
Amoxicillin-clavulanate	0.5–2.0	1.0	
Clindamycin	0.25–4.0	0.5	
Metronidazole	16–>16	>16	
Vancomycin	1.0–>16	>16	
Teicoplanin	0.25–>16	>16	
Imipenem	0.25–2.0	1.0	
Gatifloxacin	0.25–8.0	0.5	
Moxifloxacin	0.25–8.0	0.25	
Clostridium perfringens (20)			
Ranbezolid	0.016–0.125	0.06	0.06
Linezolid	1.0–4.0	2.0	2.0
Quinupristin-dalfopristin	0.25–1.0	0.5	0.5
Amoxicillin	≤0.125–0.25	≤0.125	0.25
Amoxicillin-clavulanate	≤0.125–0.5	≤0.125	≤0.125
Clindamycin	≤0.016–2.0	0.5	1.0
Metronidazole	0.5–2.0	1.0	1.0
Vancomycin	0.25–1.0	0.5	1.0
Teicoplanin	≤0.06–0.125	≤0.06	0.125
Imipenem	0.03–0.25	0.06	0.25
Gatifloxacin	0.25–1.0	0.5	1.0
Moxifloxacin	0.25–1.0	0.5	0.5
Clostridium difficile (10)			
Ranbezolid	0.03	0.03	0.03
Linezolid	2.0	2.0	2.0
Quinupristin-dalfopristin	0.5–2.0	1.0	2.0
Amoxicillin	1.0–4.0	1.0	2.0
Amoxicillin-clavulanate	0.5–4.0	1.0	2.0
Clindamycin	2.0–>32.0	4.0	>32.0
Metronidazole	0.25–0.5	0.25	0.5
Vancomycin	1.0–4.0	1.0	4.0
Teicoplanin	0.125–0.25	0.25	0.25
Imipenem	2.0–4.0	4.0	4.0
Gatifloxacin	1.0–16.0	1.0	2.0
Moxifloxacin	1.0–8.0	1.0	2.0
Clostridium spp. (15)[c]			
Ranbezolid	≤0.008–0.06	0.03	0.06
Linezolid	1.0–8.0	2.0	8.0
Quinupristin-dalfopristin	0.25–1.0	0.5	1.0
Amoxicillin	≤0.125–0.5	≤0.125	0.5
Amoxicillin-clavulanate	≤0.125–0.5	≤0.125	0.5
Clindamycin	0.03–8.0	1.0	8.0
Metronidazole	≤0.125–1.0	1.0	1.0
Vancomycin	1.0–4.0	2.0	4.0
Teicoplanin	≤0.06–4.0	≤0.06	0.5
Imipenem	0.06–0.5	0.125	0.5
Gatifloxacin	0.25–2.0	0.5	2.0
Moxifloxacin	0.25–2.0	0.5	2.0
All strains (306)			
Ranbezolid	≤0.008–4.0	0.03	0.5
Linezolid	0.125–8.0	2.0	4.0
Quinupristin-dalfopristin	≤0.125–>8.0	1.0	>8.0
Amoxicillin	≤0.125–>128.0	1.0	128.0
Amoxicillin-clavulanate	≤0.125–32.0	0.5	2.0
Clindamycin	≤0.016–>32.0	0.25	8.0
Metronidazole	≤0.125–>16.0	1.0	4.0
Vancomycin	0.125–>16.0	>16.0	>16.0
Teicoplanin	≤0.06–>16.0	1.0	>16.0
Imipenem	≤0.016–4.0	0.125	1.0
Gatifloxacin	0.06–>16.0	0.5	4.0
Moxifloxacin	0.03–>16.0	0.5	2.0

[a] *Prevotella corporis*, 4; *Prevotella loescheii*, 2; *Prevotella buccae*, 9; *Prevotella disiens*, 5; *Prevotella oris*, 2; *Prevotella oralis* group, 1; *Porphyromonas asaccharolytica*, 2; and *Porphyromonas gingivalis*, 1.

[b] *Peptostreptococcus magnus*, 11; *Peptostreptococcus micros*, 11; *Peptostreptococcus asaccharolyticus*, 10; *Peptostreptococcus tetradius*, 8; *Peptostreptococcus anaerobius*, 9; and *Peptostreptococcus prevotii*, 3.

[c] *Clostridium tertium*, 3; *Clostridium sordellii*, 2; *Clostridium ramosum*, 2; *Clostridium bifermentans*, 1; *Clostridium cadaveris*, 3; *Clostridium histolyticum*, 1; *Clostridium paraputrificum*, 1; and *Clostridium* spp., 2.

nin MICs were several dilutions lower than those of vancomycin for most bacterial groups. Amoxicillin-clavulanate was active against most groups, with an MIC_{50} of 0.5 μg/ml and an MIC_{90} of 2.0 μg/ml, while imipenem was also very active, with an MIC_{50} of 0.125 μg/ml and an MIC_{90} of 1.0 μg/ml against all strains. Clindamycin was very active, except against some strains in the *B. fragilis* group, *Prevotella* species, peptostreptococci, and clostridia, while metronidazole was active against all groups except the anaerobic gram-positive rods (with the exception of some eubacteria). The overall gatifloxacin and

moxifloxacin MIC_{50}s and MIC_{90}s were 0.5 μg/ml and 2.0 to 4.0 μg/ml, respectively, against all strains tested.

Ranbezolid is a new oxazolidinone with expanded activity against gram-positive cocci, fastidious gram-negative rods, and anaerobes (A. Rattan, A. Mehta, B. Das, M. Pandya, P. Bhateja, T. Mathur, S. Singhal, R. Sood, S. Malhotra, A. Yadav, A. Ray, R. Rao, and S. Rudra, Abstr. 42nd Intersci. Conf. Antimicrob. Agents Chemother., abstr. F-1288, 2002; D. Hoellman, L. Ednie, M. Jacobs, A. Rattan, and P. Appelbaum, Abstr. 42nd Intersci. Conf. Antimicrob. Agents Chemother., abstr. F-1289, 2002; L. M. Kelly, D. Hoellman, M. Jacobs, A. Rattan, and P. Appelbaum, Abstr. 42nd Intersci. Conf. Antimicrob. Agents Chemother., abstr. F-1290, 2002; L. Ednie, M. Jacobs, A. Rattan, and P. Appelbaum, Abstr. 42nd Intersci. Conf. Antimicrob. Agents Chemother., abstr. F-1291, 2002; A. Rattan, M. Pandya, P. Bhateja, T. Mathur, R. Dhar, B. Das, and A. Mehta, Abstr. 42nd Intersci. Conf. Antimicrob. Agents Chemother., abstr. F-1294, 2002). The present study confirms and expands the recently presented finding of the excellent antianaerobe activity of ranbezolid against both gram-negative and gram-positive anaerobes (L. Ednie et al., 42nd ICAAC). This is the first oxazolidinone of which we are aware with similar activities against both gram-negative and -positive anaerobes. Goldstein and coworkers (8) have documented that the MIC of linezolid was ≤2.0 mg/liter for fusobacteria, *Prevotella* spp., *Porphyromonas* spp., and peptostreptococci. Because only bite wound organisms were tested in this previous study, no strains of the *B. fragilis* group were examined. Wise and coworkers (13) have reported linezolid MICs of ≤4.0 mg/liter for *B. fragilis*, <2.0 mg/liter for *Clostridium perfringens*, and 8.0 μg/ml for *Clostridium difficile*. The MICs of AZD2563 for anaerobes were similar to those of linezolid, with lower MICs for gram-positive than for gram-negative organisms and also low MICs for fusobacteria (7). Our results for linezolid are similar to those of the other workers cited above (7, 8, 13). Teicoplanin, like vancomycin, was active only against gram-positive organisms. The MICs of other compounds tested in the present study were similar to those reported by other workers, with imipenem having the greatest overall activity against all groups of bacteria (1–4, 6, 9, 10).

In summary, ranbezolid had excellent in vitro activity against all groups of anaerobes tested. Pharmacokinetic-pharmacodynamic, toxicological, and ultimately clinical studies will be necessary to test whether these in vitro data translate into clinical efficacy.

This study was supported by a grant from Ranbaxy Research Laboratories.

REFERENCES

1. **Appelbaum, P. C., A. Philippon, M. R. Jacobs, S. K. Spangler, and L. Guttman.** 1990. Characterization of β-lactamases from non-*Bacteroides fragilis* group *Bacteroides* spp. belonging to seven species and their role in β-lactam resistance. Antimicrob. Agents Chemother. **34:**2169–2176.
2. **Appelbaum, P. C., S. K. Spangler, and M. R. Jacobs.** 1990. β-lactamase production and susceptibilities to amoxicillin, amoxicillin-clavulanate, ticarcillin, ticarcillin-clavulanate, cefoxitin, imipenem, and metronidazole of 320 non-*Bacteroides fragilis Bacteroides* isolates and 129 fusobacteria from 28 U.S. centers. Antimicrob. Agents Chemother. **34:**1546–1550.
3. **Appelbaum, P. C., S. K. Spangler, and M. R. Jacobs.** 1991. Susceptibilities of 394 *Bacteroides fragilis*, non-*B. fragilis* group *Bacteroides* species, and *Fusobacterium* species to newer antimicrobial agents. Antimicrob. Agents Chemother. **35:**1214–1218.
4. **Appelbaum, P. C, S. K. Spangler, and M. R. Jacobs.** 1993. Susceptibility of 539 gram-positive and -negative anaerobes to new agents, including RP 59500, biapenem, trospectomycin and piperacillin/tazobactam. J. Antimicrob. Chemother. **32:**223–231.
5. **Diekema, D. J., and R. N. Jones.** 2000. Oxazolidinones: a review. Drugs **59:**7–16.
6. **Ednie, L. M., M. R. Jacobs, and P. C. Appelbaum.** 1998. Activities of gatifloxacin compared to those of seven other agents against anaerobic organisms. Antimicrob. Agents Chemother. **42:**2459–2462.
7. **Ednie, L. M., M. R. Jacobs, and P. C. Appelbaum.** 2003. Anti-anaerobic activity of AZD2563, a new oxazolidinone, compared with eight other agents. J. Antimicrob. Chemother. **50:**101–105.
8. **Goldstein, E. J. C., D. M. Citron, and C. V. Merriam.** 1999. Linezolid activity compared to those of selected macrolides and other agents against aerobic and anaerobic pathogens isolated from soft tissue bite infections in humans. Antimicrob. Agents Chemother. **43:**1469–1474.
9. **Hoellman, D. B., L. M. Kelly, M. R. Jacobs, and P. C. Appelbaum.** 2001. Comparative antianaerobic activity of BMS 284756. Antimicrob. Agents Chemother. **45:**589–592.
10. **Livermore, D. M.** 2000. Quinupristin/dalfopristin and linezolid: where, when, which and whether to use? J. Antimicrob. Chemother. **46:**347–350.
11. **National Committee for Clinical Laboratory Standards.** 2001. Methods for antimicrobial susceptibility testing of anaerobic bacteria, 5th ed. Approved standard. NCCLS publication no. M11-A5. National Committee for Clinical Laboratory Standards, Wayne, Pa.
12. **Summanen, P., E. J. Baron, D. M. Citron, A. Strong, H. M. Wexler, and S. M. Finegold.** 1993. Wadsworth anaerobic bacteriology manual, 5th ed. Star Publishing Co., Belmont, Calif.
13. **Wise, R., J. M. Andrews, F. J. Boswell, and J. P. Ashby.** 1998. The in-vitro activity of linezolid (U-100766) and tentative breakpoints. J. Antimicrob. Chemother. **42:**721–728.