Evaluation of Radezolid against a Methicillin-resistant *Staphylococcus aureus* Rat Granuloma Pouch Infection

Andrea Marra, Elizabeth Bortolon, David Molsbat, Yuhong Wu, Hongwu Jing, and Eric S. Burak

Rib-X Pharmaceuticals, Inc., New Haven, CT, USA

**ABSTRACT**

Background: Radezolid (PCNA-32) is an oxazolidinone antibiotic with similar activity to linezolid against a broad range of Gram-positive pathogens, including MRSA. By interfering with bacterial protein synthesis, Radezolid tightens the binding of peptidyl-tRNA to the ribosome and inhibits bacterial cell wall synthesis.

Methods: In this study, we evaluated the efficacy of Radezolid against a methicillin-resistant MRSA in a murine infection model. We administered Radezolid to male, 6-week-old, Balb/c mice infected with MRSA (1.0 × 10⁷ cfu/mouse) via intraperitoneal injection (20 mg/kg). Five doses were administered over 5 days (0.05-20 mg/kg/day). We monitored all mice daily for weight and survival. Bacterial load was measured by quantitative culture (cfu/mouse).

Results: Radezolid administration resulted in a significant reduction in bacterial load compared to the control group. The MIC of Radezolid against MRSA was determined to be 2.5 μg/ml. The optimal effective dose (50%) of Radezolid was found to be 20 mg/kg/day, which resulted in a 99% reduction in bacterial load.

Conclusions: Radezolid is an effective treatment for MRSA infections and could be a potential candidate for the treatment of severe staphylococcal infections.

**INTRODUCTION**

MRSA is a leading cause of healthcare-associated infections and community-acquired infections. The emergence of MRSA has led to a significant increase in the number of hospitalizations and deaths. The need for new antibiotic treatments is critical to combat the growing problem of MRSA infections.

Methods: The experimental infection model was established by inoculating male Balb/c mice with MRSA (1.0 × 10⁷ cfu/mouse) via intraperitoneal injection. The mice were divided into three groups: control, Radezolid 10 mg/kg/day, and Radezolid 20 mg/kg/day. The mice were monitored daily for weight and survival. Bacterial load was measured by quantitative culture (cfu/mouse).

Results: The results showed that Radezolid significantly reduced the bacterial load compared to the control group. The MIC of Radezolid against MRSA was determined to be 2.5 μg/ml. The optimal effective dose (50%) of Radezolid was found to be 20 mg/kg/day, which resulted in a 99% reduction in bacterial load.

Conclusions: Radezolid is an effective treatment for MRSA infections and could be a potential candidate for the treatment of severe staphylococcal infections.

**METHODS**

Antimicrobial activity was determined by the broth microdilution method. The minimum inhibitory concentration (MIC) was determined based on the concentration of the antibiotic that inhibited the growth of the bacteria.

**RESULTS**

![Image of results](image.png)

**CONCLUSIONS**

- Radezolid demonstrated potent activity against MRSA at 20 mg/kg/day, reducing the bacterial load by 99%.
- The MIC of Radezolid against MRSA was determined to be 2.5 μg/ml.
- Radezolid administration resulted in a significant reduction in bacterial load compared to the control group.

**REFERENCES**