NEW MICROBIOLOGICA, **29**, 275-280, 2006

In vitro efficacy of Linezolid on clinical strains of Mycobacterium tuberculosis and other mycobacteria

Paola Molicotti, Silvia Ortu, Alessandra Bua, Sara Cannas, Leonardo A. Sechi, Stefania Zanetti

Department of Biomedical Sciences, Institute of Microbiology, University of Sassari

SUMMARY

Linezolid, an oxazolidinone that acts by inhibiting protein synthesis, was evaluated in strains of tuberculosis and non-tubercular mycobacteria resistant to one or more drugs isolated in northern Sardinia. The in vitro activity of Linezolid (Pfizer) was assessed on different isolates of *Mycobacterium* spp. from clinical samples by the Proportional Method. Linezolid demonstrated an excellent activity against the 24 strains of *M. tuberculosis* and against *M. gordonae*, *M. marinum*, *M. aurum*, *M. phlei*, and *M. avium*, with MIC values ranging from 0.5 to 2 µg/ml. Linezolid can be used in combination with the standard antitubercular medications, or as an effective therapeutic alternative in infections caused by *M. tuberculosis* or by other species of non-tubercular mycobacteria.

KEY WORDS: Linezolid, *Mycobacterium* spp., Proportional method, MIC

Received August 4, 2006 *Accepted* October 4, 2006

INTRODUCTION

Tuberculosis is one of the leading causes of death from a single infectious agent worldwide. According to the World Health Organization, 3 million people die of tuberculosis each year, and about 8 million new cases are reported (Dye C. *et al.,* 1999). The tuberculosis problem is exacerbated by the appearance of Multi Drug Resistant (Kim Jim Yong *et al.,* 2005) (MDR) strains and by the decreasing efficacy of the antitubercular drugs available for therapy, that have paradoxically been the same for 30 years. Drug resistant strains have been isolated in Sardinia, but their frequency appears to be lower than in the USA or Eastern Europe. Annually, about 5% of the mycobacterial strains isolated are resistant to at least one drug, and over the years strains resistant to 3 or even 4 drugs have emerged.
Infections caused by non-tubercular mycobacteria are a source of considerable and increasing concern (Bouza E. *et al.,* 2000; Skogberg K. *et al.,* 1995; Wallace R.J. *et al.,* 1997) both in immunocompromised and immunocompetent patients. Therefore, it is urgent to discover new drugs to be placed alongside the traditional therapy for patients infected by *M. tuberculosis* and other species of mycobacteria.
The new generation chemotherapeutic Linezolid (Pfizer) is a synthetic antibacterial agent belonging to a new class of antimicrobial compounds, the oxazolidinones. This drug has an optimum in vitro activity against Gram-positive bacteria (Cercenado E. *et al.,* 2001). Linezolid selectively inhibits the synthesis of bacterial proteins by binding to the bacterial ribosome (23S of the 50S subunit) and preventing the formation of the 70S ribosomal initiation complex, a basic component

Corresponding author
Paola Molicotti
Dip. Scienze Biomediche
Sezione di Microbiologia Clinica e Sperimentale
Università degli studi di Sassari
V.le San Pietro 43/b 07100 Sassari Italy
E-mail: molicott@uniss.it