

INTRODUCTION

Lower respiratory tract infections (LRTIs) are a major healthcare and economical problem due to their high morbidity and to the direct and indirect costs that their management engenders. However, the dimension of the public health problem is not the only reason for the great interest in LRTIs. They are usually treated by antimicrobial agents. Actually, once a diagnosis of LRTI has been made, empirical antibiotic therapy may be justified. When it is, the selection of antimicrobial treatment should be based on a careful clinical assessment of severity, the expected general microbial and resistance pattern and the assessment of the presence of individual risk factors for infection with resistant pathogens. Also having this concept in mind, traditional agents such as β -lactams and macrolides remain those most frequently used, although they have been compromised by bacterial resistance in the common pathogens *e.g.* *Streptococcus pneumoniae*, *Haemophilus influenzae* and *Moraxella catarrhalis*. In recent years, there have been worldwide efforts to reduce inappropriate antimicrobial prescribing in response to mounting concerns about the emergence of microbial resistance.

Several guidelines for the management of LRTIs have been published worldwide in response to the move towards evidence-based practice, concern over the misuse of antimicrobial agents and the changes in susceptibility to some of these. However, although the rational use of antibiotics can limit the development of resistances, it is not sufficient to abate the resistant bacteria. The spread of penicillin- and macrolide-resistant *S. pneumoniae*, the increasing emergence of erythromycin-resistant strains of *Streptococcus pyogenes*, the growing problem with methicillin-resistant staphylococci (MRSA) as well as the emergence of glycopeptide-resistant staphylococci underline the need for therapeutic alternatives. Therefore, new drugs must be designed with emerging needs in mind *i.e.* specific resistant and hard-to-treat organisms.

The focus of this monograph is on antimicrobial agents and their impact on lungs. For this reason, the readers will find detailed descriptions not only of the advancements in the different classes of antimicrobial agents that are usually prescribed for treating LRTIs, but also of the pulmonary distribution of these agents, the interrelationship between their pharmacokinetic profile and pharmacodynamic action, the interactions between antimicrobial agents and host defences, and the interactions between antimicrobial agents and other drugs. We are confident that consolidated and also novel information on the correct approach to the different forms of LRTI, with particular emphasis on the position of these agents in the new guidelines for the treatment of LRTIs, will add scientific value to these basic findings.

Finally, the description of the therapeutic perspectives in development will confer to this monograph a well-founded hope for an always more effective therapeutic approach to LRTIs and will provide us the opportunity to speculate on the treatment of these infectious conditions in the coming years.