

Introduction

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Optimistically, by the middle of the last century there was the idea that the battle against infections would be won. However, it soon became evident that the mechanisms of adaptation of bacteria to new conditions, including the widespread use of antibiotics, would help them to survive even in hostile environments. Now, it is clear that the battle continues and that the advances of treatments in other areas have changed the battlefield.

This is particularly true in respiratory infections. The different forms of pneumonia are still a clinical challenge and their mortality is still significant in the elderly or immunosuppressed, but other forms of respiratory infections are responsible for a great burden of disease. In particular, infections of the bronchial tree, which include a spectrum of clinical manifestations from benign acute bronchitis in otherwise healthy individuals, to severe exacerbations of patients affected by chronic obstructive pulmonary disease (COPD) or bronchiectasis that are probably the most frequent types of infections in adults. It is no exaggeration to say that everybody has suffered some (or several) form(s) of bronchial infection, fortunately most of them are self-limited, but even the milder forms represent a major cause of morbidity, use of healthcare resources and work absenteeism. The major pathogens involved are the respiratory viruses and bacteria such as *Haemophilus influenzae*, *Streptococcus pneumoniae* and *Pseudomonas aeruginosa*, among others. The aetiological agents will vary depending on the characteristics and baseline respiratory health of the host.

This issue of *European Respiratory Monograph (ERM)* covers the spectrum of bronchial infection, from the milder to the most severe. After explaining the mechanisms of defence within the bronchial tree, the different chapters will elegantly show the clinical manifestations, treatment and prognosis of these frequent diseases.

A number of chapters are dedicated to the chronic bronchial infection in COPD. Up to 10% of adults over the age of 40 years are affected by COPD. The impaired host defences in COPD allow the establishment and proliferation of potentially pathogenic microorganisms (PPMs). Repeated isolation of PPMs in bronchial secretions in stable patients was defined as colonisation; however, it is well documented that the presence of PPMs in the lower airways is associated with increased exacerbation frequency and severity, a faster lung function decline and worse health status. Therefore, the term chronic bronchial infection (CBI) has been proposed to define this clinical situation. The presence of CBI in COPD is characterised by increased chronic inflammation not only in the airways and lung parenchyma, but also at a systemic level. Current evidence indicates that a significant amount of local and systemic inflammatory response in COPD may be attributable to the presence of PPMs. Since atherosclerosis is also characterised by chronic inflammation and oxidative stress, it has been hypothesised that CBI may be responsible for some extrapulmonary manifestations of COPD, particularly the high prevalence of cardiovascular comorbidities.

CBI is linked to acute episodes of increased symptoms, the so-called exacerbations of COPD, which is also covered in this current issue of the *ERM*, from the point of view of: the different infective aetiologies; viruses and bacteria and their interrelationships; the impact of exacerbations

in the course of the disease; antimicrobial treatment and prevention; and along with new evidence for the use of long-term antibiotics in a selected group of patients with COPD and frequent exacerbations.

Finally, there are a number of chapters dedicated to bronchiectasis, once considered an orphan lung disease. In contrast, there is an increased interest in the aetiology, natural history and treatment of bronchiectasis, either as an isolated disease or as a complication of another respiratory condition, such as COPD. The innovative administration of antibiotics by inhalation may represent an advance in the treatment of CBI in bronchiectasis, and the development of new formulations of old antibiotics to be administered by this route will provide a new therapeutic option for some of the most difficult-to-treat severe patients with bronchial infections.

We are sure that clinicians will find this *ERM's* summary of the existing evidence within this field, alongside some of the most relevant and new information that has arisen to date, as a great aid to them in improving their practice and care for patients with these very frequent respiratory problems.