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Introduction

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Cardiovascular and respiratory diseases are two of the leading causes of all-cause mortality. Both are closely related. Knowing the relationship between the two groups of diseases is key to the management of the patient. https://bit.ly/3efOiN3

CVD and respiratory disease are two of the main causes of morbidity, mortality and health costs all over the world. The main organs affected by these diseases – the heart and lungs – are closely related in both physiological and pathological terms. Many CVDs, or their treatment, can affect the respiratory system, and the vast majority of lung diseases can involve or be associated with diseases of the cardiovascular system.

This close relationship probably reflects two fundamental circumstances: on the one hand, the high prevalence of these groups of diseases can mean that a single patient can suffer from both simultaneously, with one acting as a comorbidity of the other. This situation will become increasingly common, due to human beings' progressively greater longevity and the subsequent chronification of many diseases. On the other hand, both types of diseases share many of the same pathophysiological pathways and support mechanisms, as demonstrated in both murine models and human studies.

A knowledge of the potential cardiovascular implications and complications inherent in the most prevalent lung diseases, and their treatment, may be crucial for clinicians as they could have therapeutic implications for a respiratory disease and influence its prognosis.

Several studies have investigated the greater cardiovascular risk associated with lung diseases with a high inflammatory burden, such as COPD, asthma, and both acute and chronic respiratory infections. This situation may occur because such diseases share, or are capable of activating, some of the intermediate pathophysiological mechanisms in cardiovascular damage.

Some respiratory diseases, can, in the advanced stages of their evolution, affect cardiac function as a result of changes in vascular resistance or in the structure of the vessels. This is the case in pulmonary thromboembolism, some interstitial diseases and hypoventilation syndromes.

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Diseases such as lung cancer and the intermittent hypoxaemia or sleep fragmentation caused by OSA can influence the cardiovascular system, either by spreading or by secreting biological mediators or implementing mechanisms that have been proven to cause vascular damage.

Finally, although the therapies used for the management of respiratory diseases are generally effective and safe, it is well known that many of the adverse effects of drugs, used in the management of pulmonary diseases, such as bronchodilators, corticosteroids, antibiotics, antifibrotics, anticoagulants, anti-tumoral and anti-inflammatory therapies, may incorporate a degree of cardiovascular risk, particularly in some particularly susceptible patients.

In this *ERS Monograph*, we have tried to offer the reader a complete overview of the interaction between pulmonary diseases and CVDs, not only from an epidemiological point of view [1], but also from a pathophysiological [2], and more particularly, clinical and therapeutic point of view. Accordingly, after reviewing some basic concepts, the book has been divided into: firstly, each important group of respiratory diseases and their cardiopulmonary implications [3–14]; then to the groups of drugs most used in pulmonology and their potential cardiovascular effects [15–19]; and finally, to future diagnostic challenges in this field [20]. Three clinical cases have also been chosen to illustrate different situations taken from real life, in order to delve more fully into the concepts discussed in this book [21–23].

We hope that this *Monograph* provides you with some of the answers to the questions you have asked in daily practise when trying to diagnose and treat complex patients who suffer from both cardiovascular and respiratory pathology. That was our main objective.

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