

## Bronchitis and COPD

0050

### Vitamin D and COPD – an overview

*Rüdiger Siekmeier<sup>1</sup>, Graciela Delgado<sup>2</sup>, Laurin Titze<sup>3</sup>, Tanja Grammer<sup>2</sup>, Stefan Pilz<sup>4</sup>, Marcus Kleber<sup>2,5</sup>, Winfried März<sup>2,6,7</sup>*

<sup>1</sup>Pharmaceutical Institute, University Bonn, Drug Regulatory Affairs, Bonn, Germany

<sup>2</sup>University of Heidelberg, Medical Clinic V, Mannheim Medical Faculty, Heidelberg, Germany

<sup>3</sup>University of Freiburg, Department of Thoracic Surgery, Freiburg, Germany

<sup>4</sup>Medical University Graz, Clinical Institute of Medical and Chemical Laboratory Diagnostics, Medical University Graz, Graz, Austria

<sup>5</sup>University of Jena, Institute of Nutrition, Jena, Germany

<sup>6</sup>Medical University Graz, Clinical Institute of Medical and Chemical Laboratory Diagnostics, Graz, Austria

<sup>7</sup>Synlab Holding Deutschland GmbH, Synlab Academy, Mannheim, Germany

**Introduction:** Since decades the role of vitamin D for prevention and treatment of bone diseases (rickets, osteomalacia, osteoporosis) is known. Beyond this important pleiotropic effects, e. g. regulation of immune response and inflammation, obesity, musculoskeletal development, growth and development were subject of interest in the last decade. It was observed that individuals with low vitamin D plasma concentrations are at risk, e. g. for cardiovascular disease, cancer, type 2 diabetes mellitus, airway inflammation and acute respiratory infection as well as asthma and chronic obstructive pulmonary disease (COPD). Study aim was a literature review on the role of vitamin D in COPD.

**Materials and methods:** A PUBMED search for publications on the role of vitamin D deficiency in COPD pathogenesis and the effect of vitamin D supplementation was made.

**Results:** Fetal and neonatal vitamin D plasma concentration strongly depend on maternal vitamin D status. Vitamin D affects prenatal and early childhood lung development, plays an important role in development of adaptive immune system affecting both, cells (e. g. T-helper cells) and regulatory cytokines (e. g. IL-10), influences airway remodelling by suppression of bronchial airway muscle cell proliferation, reduces the risk of respiratory tract infections and may act synergistically with steroids. Vitamin D deficiency correlates with an increased risk for COPD and lung function decline. The effect is modulated differently by the genetic polymorphism of vitamin D binding protein (VDBP, e. g. GC1F allele as a risk factor in Asian but not Caucasians). However, the effect of vitamin D supplementation on COPD exacerbation is discussed controversially.

**Conclusions:** Numerous epidemiological and clinical studies and meta-analyses demonstrated vitamin D deficiency to be a risk factor for COPD. However, further controlled clinical studies should be performed to confirm the evidence and to rule out the protective effect of vitamin D supplementation in different subgroups.