

Title: Polyphenols as Therapeutics in Respiratory Diseases: Moving from Preclinical Evidence to Potential Clinical Applications

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Abstract: Respiratory diseases are the most common and severe health complication and a leading cause of death worldwide. Despite breakthroughs in diagnosis and treatment, few safe and effective therapeutics have been reported. Phytochemicals are gaining popularity due to their beneficial effects and low toxicity. Polyphenols are secondary metabolites with high molecular weights found at high levels in natural food sources such as fruits, vegetables, grains, and citrus seeds. Over recent decades, polyphenols and their beneficial effects on human health have been the subject of intense research, with notable successes in preventing major chronic non-communicable diseases. Many respiratory syndromes can be treated effectively with polyphenolic supplements, including acute lung damage, pulmonary fibrosis, asthma, pulmonary hypertension, and lung cancer. This review summarizes the role of polyphenols in respiratory conditions with sufficient experimental data, highlights polyphenols with beneficial effects for each, and identifies those with therapeutic potential and their underlying mechanisms. Moreover, clinical studies and future research opportunities in this area are discussed.

Keywords: Polyphenols, Respiratory diseases, Lung cancer, Asthma, ARDS, Tuberculosis

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