

Pulmonary Hypertension Diagnosis: A Comprehensive Review of AI and Machine Learning Approaches

Pulmonary hypertension (PH) refers to a group of diseases characterized by elevated blood pressure in the pulmonary arteries supplying the lungs. Accurate diagnosis of PH and determining its underlying causes is crucial but often challenging for physicians. The development of artificial intelligence (AI) techniques may help address this challenge by enhancing the diagnostic process. This paper aims to systematically review the existing literature on applications of AI, especially machine learning, in PH diagnosis and aetiology prediction. A comprehensive literature search will be conducted in major bibliographic databases without date or language restrictions. Studies applying AI methods to analyze clinical, imaging and biomarker data for PH diagnosis or cause classification will be included. Essential information on study design, AI algorithm employed, diagnostic or predictive performance, dataset characteristics and limitations will be extracted. A preliminary search has identified several studies developing AI models for automated classification of PH subgroups from various diagnostic modalities. However, investigations directly comparing AI-based approaches against clinical practice are still scarce. This review seeks to provide a systematic assessment of the potential utility and current limitations of AI in modernizing PH diagnosis. It intends to outline promising research directions and highlight gaps needing further studies to realize the full benefits of AI for improving patient management and outcomes in PH.

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