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Systematic Review and Meta-Analysis of Magnetic Resonance Imaging in the Diagnosis of Pulmonary Embolism

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 14 July 2024 and was last updated on 14 July 2024.

INTRODUCTION

Review question / Objective To systematically assess the diagnostic accuracy of magnetic resonance imaging (MRI) in identifying pulmonary embolism (PE) through an updated and comprehensive meta-analysis.

Condition being studied The capability of MRI to accurately diagnose pulmonary embolism, considering its clinical importance and the need for radiation-free diagnostic alternatives.

METHODS

Participant or population Adults suspected of having pulmonary embolism, with studies including those comparing MRI results with established diagnostic standards such as CTPA, DSA, or radionuclide scanning.

Intervention The use of MRI as a diagnostic tool for detecting pulmonary embolism in clinical settings.

Comparator MRI diagnostic outcomes are compared against gold-standard methods like Computed Tomography Pulmonary Angiography (CTPA) and other established diagnostic procedures.

Study designs to be included Prospective cohort studies, retrospective cohort studies, cross-sectional studies, case-control studies.

Eligibility criteria Included studies must utilize MRI for diagnosing PE, provide sufficient data for sensitivity and specificity calculations, and be published in English or Chinese. Exclusions include small sample studies, duplicates, reviews, and non-human research.

Information sources Searches conducted across multiple databases including PubMed, Embase, Cochrane Library, CNKI, Wanfang Database, VIP Database, and CBM up to May 2024.

Main outcome(s) Main outcomes include pooled sensitivity, specificity, positive and negative likelihood ratios, diagnostic odds ratios, and the area under the curve (AUC) of the summary receiver operating characteristic (SROC).

Quality assessment / Risk of bias analysis Quality and potential bias of included studies assessed using the QUADAS tool, ensuring a reliable and applicable review of diagnostic accuracy.

Strategy of data synthesis Meta-analysis using Stata 17.0 and Meta-Disc 1.4, applying random-effects or fixed-effects models based on detected heterogeneity among studies.

Subgroup analysis Subgroup analysis conducted based on variables like study location and the MRI techniques used, to explore potential sources of heterogeneity in diagnostic performance.

Sensitivity analysis Sensitivity of the meta-analysis results tested by the sequential omission of individual studies to identify influences of specific data sets on overall outcomes.

Country(ies) involved China.

Keywords Magnetic Resonance; Pulmonary Embolism; Meta-Analysis.

Contributions of each author

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