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AI-Assisted Diagnosis on Adenomas of Different Sizes: A Meta-Analysis

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ADMINISTRATIVE INFORMATION

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Review Stage at time of this submission - Data analysis.

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 16 March 2025 and was last updated on 16 March 2025.

INTRODUCTION

Review question / Objective This meta-analysis aims to evaluate the effectiveness of AI-assisted diagnosis compared to conventional colonoscopy in detecting adenomas of different sizes, providing evidence to enhance colorectal cancer screening practices.

Condition being studied Adults undergoing colonoscopy for colorectal cancer screening, surveillance, or diagnosis.

METHODS

Participant or population Adults (≥18 years) undergoing colonoscopy with AI-assisted diagnosis or conventional methods.

Intervention AI-assisted colonoscopy for adenoma detection.

Comparator Conventional colonoscopy.

Study designs to be included Randomized controlled trials (RCTs) comparing AI-assisted colonoscopy with conventional methods.

Eligibility criteria
(1) Adults (18 years or older) undergoing colonoscopy.
(2) Randomized controlled trials (RCTs) comparing AI-assisted colonoscopy with conventional methods.
(3) Outcomes examined include adenoma detection rate (ADR) and adenoma miss rate (AMR) stratified by adenoma size (≤5 mm, 6–9 mm, ≥10 mm).

Information sources Data was collected from databases such as PubMed, Embase, Cochrane Library, Web of Science, ClinicalTrials.gov, CNKI, Wanfang, VIP, and CBM.

Main outcome(s) Key outcome metrics include ADR and AMR for adenomas ≤5 mm, 6–9 mm, and ≥10 mm.

Quality assessment / Risk of bias analysis Study quality was evaluated using the Cochrane Risk of Bias tool. Any discrepancies between reviewers were resolved through consensus or a third-party adjudicator.

Strategy of data synthesis The meta-analysis was conducted using RevMan 5.4 software. For categorical data, results were expressed as relative risks (RR), while continuous data were presented as mean differences (MD), both with 95% confidence intervals (CI). The quality of evidence was graded using the GRADE approach.

Subgroup analysis Subgroup analyses were conducted to explore potential factors influencing the effect of AI-assisted diagnosis on ADR and AMR. These analyses focused on different adenoma size categories (≤5 mm, 6–9 mm, ≥10 mm), study locations, AI-assisted diagnostic system types, and endoscopist experience levels.

Sensitivity analysis Sensitivity analyses were conducted by systematically removing individual studies one at a time to assess the stability of the aggregated findings.

Country(ies) involved China.

Keywords AI-assisted diagnosis; adenoma detection rate; adenoma miss rate; colonoscopy; meta-analysis.

Contributions of each author
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