INPLASY PROTOCOL

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Artificial intelligence in gastric cancer detection.

Support: None.

Review Stage at time of this submission: Preliminary searches.

Conflicts of interest: None declared.

Performance of artificial intelligence in gastric cancer detection: A protocol for systematic review and meta-analysis

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Review question / Objective: P=patients who had undergone gastric cancer; I=AI for diagnosing gastric cancer; C=pathology for diagnosing gastric cancer; O=sensitivity, specificity, positive and negative likelihood ratio, diagnostic odds ratio, and the area under the curve of the summary receiver operating characteristic; S=clinical cohort or case control studies.

Condition being studied: Gastric cancer is one of the most common malignancies across the globe. With the deepening research of its efficient computing power and learning capacities, there has been promising applications of artificial intelligence (AI) in the gastric cancer field. AI advancements provides a promising method to increase the detection rate of adenoma, especially in computer aided detection and computer aided diagnosis.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 16 October 2022 and was last updated on 16 October 2022 (registration number INPLASY2022100063).

INTRODUCTION

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METHODS

Participant or population: Patients who had undergone gastric cancer.

Intervention: AI with pathology for diagnosing gastric cancer.

Comparator: Not applicable.

Study designs to be included: Clinical cohort or case control studies.

Eligibility criteria: Inclusion Criteria: studies were required to (1)patients who had undergone gastric cancer (2)only include high quality clinical cohort or case control studies Exclusion criteria: (1) Essential information not available; (2) Studies not published as full text article; (3) Studies including less than 50 patients in each group.

Information sources: This study will be conducted in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines electronic databases: PubMed, Web of Science, Cochrane Library, and Chinese biomedical databases.

Main outcome(s): Sensitivity, specificity, positive and negative likelihood ratio, diagnostic odds ratio, and the area under the curve of the summary receiver operating characteristic.

Quality assessment / Risk of bias analysis: The true positives, true negatives, false positives, and false negatives in the fourfold (2 × 2) tables were also collected. Methodological quality was independently assessed by 2 researchers based on the quality assessment of studies of diagnostic accuracy studies (QUADAS) tool.The QUADAS criteria included 14 assessment items. Each of these items was scored as "yes" (2), "no" (0), or "unclear"(1). The QUADAS score ranged from 0 to 28, and a score ≥22 indicated good quality.

Strategy of data synthesis: We use RevMan 5.3 (The Cochrane Collaboration, Copenhagen, Denmark) to calculate the pooled summary statistics for sensitivity, specificity , positive and negative likelihood ratio, and diagnostic odds ratio with their 95% confidence intervals. The summary receiver operating characteristic curve and corresponding area under the curve will be obtained. The threshold effect will be assessed using Spearman correlation coefficients. The Cochran's Q-statistic and I test will be used to evaluate potential heterogeneity between studies. If significant heterogeneity was detected(Q test P50%), a random effects model or fixed effects model was used.

Subgroup analysis: We perform sub group and meta-regression analyses to investigate potential sources of heterogeneity.

Sensitivity analysis: To evaluate the influence of single studies on the overall estimate, a sensitivity analysis would be performed. We will conduct Begg's funnel plots and Egger's linear regression tests to investigate publication bias.

Country(ies) involved: China.

Keywords: artificial intelligence, meta-analysis, gastric cancer.

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