

INPLASY

Diagnostic performance of contrast-enhanced ultrasonography for predicting therapeutic response to radiofrequency ablation in patients with hepatocellular carcinoma: A systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Preliminary searches.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202440089

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 22 April 2024 and was last updated on 22 April 2024.

INTRODUCTION

Review question / Objective Assess the diagnostic value of CEUS for residual or recurrent HCC after RFA using a meta-analytic approach.

Condition being studied Contrast-enhanced ultrasonography (CEUS) is commonly performed to detect residual tumors after radiofrequency ablation (RFA) for hepatocellular carcinoma.

METHODS

Participant or population Those diagnosed with HCC and treated with RFA.

Intervention CEUS.

Comparator CECT or CEMRI.

Study designs to be included Prospective or retrospective.

Eligibility criteria (1) Patients: those diagnosed with HCC and treated with RFA; (2) Diagnostic tool: CEUS; (3) Gold standard tool: CECT or CEMRI; (4) Outcomes: true-positive, false-positive, false-negative, and true-negative results or data obtained via analytical transformation; and (5) Study design: prospective or retrospective. Reviews, letters, and animal experiments were excluded owing to irrelevance or lack of relevant data.

Information sources To identify potential eligible studies, PubMed, Embase, and the Cochrane Library were searched from inception to March 2024.

Main outcome(s) True-positive, false-positive, false-negative, and true-negative results or data obtained via analytical transformation.

Quality assessment / Risk of bias analysis Quality Assessment of Diagnostic Accuracy Studies-2 tool.

Strategy of data synthesis A bivariate generalized linear mixed model and random effects model were used for meta-analysis.

Subgroup analysis Subgroup analyses of diagnostic parameters were conducted based on publication year, study design, ethnicity, blinding, age of the patients, use of contrast agent, gold standard tool, and time of CEUS detection.

Sensitivity analysis Based on the true-positive, false-positive, true-negative, and false-negative data, sensitivity, specificity, positive likelihood ratio (PLR), negative likelihood ratio (NLR), diagnostic odds ratio (DOR), and area under the receiver operating characteristic curve (AUC) were calculated. A bivariate generalized linear mixed model and random effects model were used for meta-analysis. Heterogeneity among included studies was assessed using I² and Q statistics, with I² ≥ 50.0% or P < 0.10 indicating significant heterogeneity. Subgroup analyses of diagnostic parameters were conducted based on publication year, study design, ethnicity, blinding, age of the patients, use of contrast agent, gold standard tool, and time of CEUS detection. Between-subgroup differences were compared using the interaction t test. The publication bias of CEUS was evaluated using funnel plots and the Deeks' asymmetry test. All reported P values were two-sided, with a test level of 0.05 for the combined results. All statistical analyses were conducted using the STATA software (version 12.0; STATA Corp., College Station, TX, USA).

Country(ies) involved China.

Keywords Diagnostic, contrast-enhanced ultrasonography, hepatocellular carcinoma; radiofrequency ablation.

Contributions of each author

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