INPLASY PROTOCOL

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None declared.

Diagnostic performance of dynamic susceptibility contrast-enhanced perfusion-weighted imaging in differentiating recurrence from radiation injury in postoperative glioma: a meta-analysis

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Review question / Objective: **Differential diagnosis of tumor recurrence (TR) and radiation injury (RI) in patients with glioma after surgery and radiotherapy is important. We aim to assess the diagnostic utility of dynamic susceptibility contrast-enhanced perfusion-weighted imaging (DSC-PWI) for the differential diagnosis of TR and RI in patients with glioma.**
Condition being studied: **At present, many functional MRI techniques, such as diffuse-weighted imaging (DWI), perfusion-weighted imaging (PWI), and MRI spectroscopy (MRS), have been widely used to analysis of tumor or necrotic tissue properties and provide more accurate information on its nature. However, the results from a single retrospective study are not enough. Therefore, a meta-analysis should be performed to increase the statistical power of the small sample study.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 28 November 2021 and was last updated on 28 November 2021 (registration number INPLASY2021110101).

INTRODUCTION

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METHODS

Search strategy: ((((recurrence) OR (recurrent)) AND (radiation injury)) AND (glioma)) AND (((perfusion weighted imaging) OR (PWI)) OR(PW)).

Participant or population: Paitents with glioma.

Intervention: Recurrence.

Comparator: Radiation injury.

Study designs to be included: Studies eligible for inclusion were: (a) studies assessing the differential diagnosis of TR and RI in patients with glioma; (b) PWI was used as the diagnostic tool; (c) DSC was used as the PWI technique; and (d) studies in which sensitivity and specificity were provided.

Eligibility criteria: Studies eligible for inclusion were: (a) studies assessing the differential diagnosis of TR and RI in patients with glioma; (b) PWI was used as the diagnostic tool; (c) DSC was used as the PWI technique; and (d) studies in which sensitivity and specificity were provided.

Information sources: The PubMed, Embase, and Cochrane Library were searched for relevant articles. The publication data was set until to October 2021.

Main outcome(s): Diagnostic performance.

Quality assessment / Risk of bias analysis: Risk of bias of each study was evaluated with the quality assessment of diagnostic accuracy studies (QUADAS-2) tool.

Strategy of data synthesis: RevMan v5.3 and Stata v12.0 are employed for this meta-analysis. We pooled sensitivity, specificity, positive likelihood ratio (PLR), negative likelihood ratio (NLR), and relative cerebral blood volume (rCBV) values from the included studies. A significantly higher likelihood of correctly diagnosing TR or RI were indicated by PLR > 5 or NLR < 0.2. Summary receiver operating characteristic (SROC) curves were generated, and when the area under the curve (AUC) of this curve was > 80%, diagnostic accuracy was considered to be good. Heterogeneity is assessed by I2 tests, with I2 > 50% suggesting significant heterogeneity. Random-effects models are employed for significant heterogeneity, while fixed-effects models are employed for significant homogeneity. $P < 0.05$ was the significance threshold. The sources of heterogeneity were detected by the sensitivity, subgroup, and meta-regression analyses. Deeks' funnel plot and Egger test were used to evaluate publication bias, with $P < 0.05$ being considered to be indicative of such bias.

Subgroup analysis: None.

Sensitivity analysis: None.

Country(ies) involved: China.

Keywords: DSC-PWI; MRI; glioma; recurrence; radiation injury.

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