INPLASY PROTOCOL

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None declared.

Dynamic susceptibility contrast-enhanced perfusion-weighted imaging in differentiation between recurrence and pseudoprogression in high-grade glioma: a meta-analysis

Gu, X[1]; He, X[2]; Wang, H[3]; Li, J[4]; Chen, R[5]; Li, R[6]; Liu, H[7].

Review question / Objective: **To assess the diagnostic ability of dynamic susceptibility contrast-enhanced (DSC) PWI (DSC-PWI) for in differentiating recurrent tumor and pseudoprogression for high grade glioma (HGG) patients.**
Condition being studied: **Gliomas account for about a third of nervous system tumors and the majority of malignancies. The incidence is between five and six per 100 000. The tumor is usually treated by resection and radiotherapy together with temozolomide-based chemotherapy. Magnetic resonance imaging (MRI) is the most commonly used follow-up method for monitoring post-operative recurrence. However, an abnormal MRI signal may represent either tumor recurrence (TR) or radiation injury (RI), and it is important to distinguish between them. Other MRI techniques, including diffuse-weighted imaging (DWI), perfusion-weighted imaging (PWI), and MRI spectroscopy (MRS), are often used for analyzing cancer and necrotic tissue and these may be better able to differentiate TR and RI lesions.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 13 February 2023 and was last updated on 13 February 2023 (registration number INPLASY202320056).

INTRODUCTION

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monitoring post-operative recurrence. However, an abnormal MRI signal may represent either tumor recurrence (TR) or radiation injury (RI), and it is important to distinguish between them. Other MRI techniques, including diffuse-weighted imaging (DWI), perfusion-weighted imaging (PWI), and MRI spectroscopy (MRS), are often used for analyzing cancer and necrotic tissue and these may be better able to differentiate TR and RI lesions.

METHODS

Search strategy: ((((((((perfusion weighted imaging) OR (PWI)) OR (perfusion MR)) OR (MR perfusion)) OR (dynamic susceptibility contrast-enhanced)) OR (DSC)) AND (((recurrence) OR (recurrent)) OR (progression))) AND (((radiation injury) OR (necrosis)) OR (pseudoprogression))) AND ((glioblastoma) OR (glioma)).

Participant or population: Patients with HGG and were treated by surgical resection.

Intervention: Patients with RT.

Comparator: Patients with PsP.

Study designs to be included: Diagnostic accuracy articles.

Eligibility criteria: (a) studies assessing the differential diagnosis of RT and PsP in patients with HGG; (b) PWI was used as the diagnostic tool; (c) DSC was used as the PWI technique; (d) studies in which sensitivity and specificity were provided.

Information sources: Relevant articles in the PubMed, Web of science, and Wanfang databases.

Main outcome(s): Diagnostic accuracy.

Quality assessment / Risk of bias analysis: The likelihood of bias in included studies was assessed using the quality assessment of diagnostic accuracy studies (QUADAS-2) tool.

Strategy of data synthesis: The sensitivity, specificity, positive likelihood ratio (PLR), negative likelihood ratio (NLR), and relative cerebral blood volume (rCBV) values from the individual studies were pooled. A high likelihood of correct diagnosis for either TR or RI was represented by PLR > 5 or NLR < 0.2. Summary receiver operating characteristic (SROC) curves were produced; the diagnosis was judged to be reliable when the area under the curve (AUC) was > 80%.

Subgroup analysis: Yes.

Sensitivity analysis: None.

Country(ies) involved: China.

Keywords: Glioma, Recurrence, Pseudoprogression, MRI.

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