

Review Expert Rev Anticancer Ther. 2024 Nov;24(11):1177-1185.

doi: 10.1080/14737140.2024.2415404. Epub 2024 Oct 14.

# Diagnostic accuracy of magnetic resonance diffusion tensor imaging in distinguishing pseudoprogression from glioma recurrence: a systematic review and meta-analysis

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PMID: 39400036 DOI: [10.1080/14737140.2024.2415404](https://doi.org/10.1080/14737140.2024.2415404)

## Abstract

**Purpose:** To evaluate the diagnostic accuracy of diffusion tensor imaging (DTI)-derived metrics mean diffusivity (MD) and fractional anisotropy (FA) in differentiating glioma recurrence from pseudoprogression.

**Methods:** The Cochrane Library, Scopus, PubMed, and the Web of Science were systematically searched. Study selection and data extraction were done by two investigators independently. The quality assessment of diagnostic accuracy studies was applied to evaluate the quality of the included studies. Combined sensitivity (SEN) and specificity (SPE) and the area under the summary receiver operating characteristic curve (SROC) with the 95% confidence interval (CI) were calculated.

**Results:** Seven high-quality studies involving 246 patients were included. Quantitative synthesis of studies showed that the pooled SEN and SPE for MD were 0.81 (95% CI 0.70-0.88) and 0.82 (95% CI 0.70-0.90), respectively, and the value of the area under the SROC curve was 0.88 (95% CI 0.85-0.91). The pooled SEN and SPE for FA were 0.74 (95% CI 0.65-0.82) and 0.79 (95% CI 0.66-0.88), respectively, and the value of the area under the SROC curve was 0.84 (95% CI 0.80-0.87).

**Conclusions:** This meta-analysis showed that both MD and FA have a high diagnostic accuracy in differentiating glioma recurrence from pseudoprogression.

**Registration:** PROSPERO protocol: CRD42024501146.

**Keywords:** Meta-analysis; diagnostic accuracy; diffusion tensor imaging; glioma; pseudoprogression.

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