RESEARCH TOPIC MEM8

Imaging and biological markers for prediction and identification of glioblastoma pseudoprogression
Curriculum MEM

Clinical Unit name and address
Neuroradiology Dept.,IRCCS Humanitas Research Hospital

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Laboratory of Pharmacology and Brain Pathology, IRCCS Humanitas Research Hospital

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Abstract
A major limitation to the assessment of efficacy of therapeutic strategies is the occurrence of imaging findings where treatment-induced modifications mimic tumor progression (pseudoprogression) occuring in 10-30% of glioblastoma (GBM) patients.
Failure to recognize pseudoprogression leads to premature discontinuation of therapy due to inappropriate evaluation of therapy response. In order to differentiate pseudoprogression from true disease progression, a multidisciplinary approach based on plasma markers of inflammation, circulating extracellular microvesicles and and multimodal imaging (18F-GE-180 PET and advanced MRI techniques) is proposed. The working hypothesis is that the in vivo detection of neuroinflammation, BBB-disruption, absence of neovascularization, macrophage recruitment and microglial activation through imaging techniques and plasma markers might disclose those cases in which apparent increase in tumor size is driven by treatment-induced inflammation.

Main technical approaches
Basic knowledge on immuno biology and immune related techniques.

Scientific references
1) Advanced imaging techniques for differentiating pseudoprogression and tumor recurrence after immunotherapy for glioblastoma. Li Y, et al.
Front Immunol. 2021 Nov 25;12:790674.

2) Pseudoprogression versus true progression in glioblastoma patients: A multiapproach literature review: Part 1 - Molecular, morphological and clinical features.
Le Fèvre C, et al.
Crit Rev Oncol Hematol. 2021 Jan;157:103188.

3) Liquid biopsy strategies to distinguish progression from pseudoprogression and radiation necrosis in glioblastomas.
Yekula A, et al.
Adv Biosyst. 2020 Dec;4(12):e2000029.

Type of contract

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