ABSTRACT

Nucl Med Commun. 2021 Dec 2;43(3):270-274. doi: 10.1097/MNM.0000000000001510.

Distinguishing between primary central nervous system lymphoma and glioblastoma using [18F]fluoromisonidazole and [18F]FDG PET.

Uchinomura S(1)(2), Mitamura K(2), Norikane T(2), Yamamoto Y(2), Oishi A(3), Hatakeyama T(4), Miyake K(4), Nishiyama Y(2).

Author information:
(1)Department of Radiology, Sumitomo Besshi Hospital, Niihama, Ehime.
(2)Department of Radiology, Faculty of Medicine, Kagawa University.
(3)Department of Clinical Radiology, Kagawa University Hospital.
(4)Department of Neurological Surgery, Faculty of Medicine, Kagawa University, Kita-gun, Kagawa, Japan.

OBJECTIVE: The purpose of this study was to assess the diagnostic value of [18F]fluoromisonidazole (FMISO) and 2-deoxy-2-[18F]fluoro-D-glucose (FDG) PET to discriminate primary central nervous system lymphoma (PCNSL) from glioblastoma.

METHODS: FMISO and FDG PET/CT scans before therapy obtained in 13 patients with PCNSL and in 62 patients with glioblastoma were retrospectively reviewed. PET results were evaluated by visual and semiquantitative analysis. For semiquantitative analysis, the maximum standardized uptake value (SUV) for tumor (T) and the mean SUV for normal contralateral hemisphere (N) were calculated, and the tumor-to-normal (T/N) ratio was determined. The performance in discriminating PCNSL and glioblastoma was evaluated using a receiver-operating characteristics analysis. Area-under-the-curve (AUC) values for the discrimination were calculated.

RESULTS: On visual analysis, 54% of PCNSL and 89% of glioblastoma showed positive on FMISO PET. All patients with PCNSL and glioblastoma were FDG positive. FMISO T/N ratio in PCNSL (mean ± SD = 1.80 ± 0.59) was significantly lower than that in glioblastoma (mean ± SD = 2.75 ± 0.84) ($P < 0.001$). FDG T/N ratio in PCNSL (mean ± SD = 3.01 ± 1.11) was significantly higher than that in glioblastoma (mean ± SD = 1.77 ± 0.79) ($P < 0.001$). For discrimination of patients with PCNSL from glioblastoma, the AUC values for the FMISO T/N ratio, FDG T/N ratio and combination of the two parameters were 0.833, 0.825 and 0.900, respectively.

CONCLUSION: FMISO PET is as helpful for differentiating PCNSL from glioblastoma as FDG PET.

DOI: 10.1097/MNM.0000000000001510
PMID: 34864812 [Indexed for MEDLINE]