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Added value of [¹⁸F]FDOPA PET to the management of high-grade glioma patients after their initial treatment: a prospective multicentre study

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Abstract

Background: Diagnostic value of 3,4-dihydroxy-6-[¹⁸F]fluoro-L-phenylalanine ([¹⁸F]FDOPA) PET in patients with suspected recurrent gliomas is recognised. We conducted a multicentre prospective study to assess its added value in the practical management of patients suspected of recurrence of high grade gliomas (HGG).

Methods: Patients with a proven HGG (WHO grade III and IV) were referred to the multidisciplinary neuro-oncology board (MNOB) during their follow-up after initial standard of care treatment and when MRI findings were not fully conclusive. Each case was discussed in 2 steps. For step 1, a diagnosis and a management proposal were made only based on the clinical and the MRI data. For step 2, the same process was repeated taking the [¹⁸F]FDOPA PET results into consideration. A level of confidence for the decisions was assigned to each step. Changes in diagnosis and management induced by [¹⁸F]FDOPA PET information were measured. When unchanged, the difference in the confidence of the decisions were assessed. The diagnostic performances of each step were measured.

Results: 107 patients underwent a total of 138 MNOB assessments. The proposed diagnosis changed between step 1 and step 2 in 37 cases (26.8%) and the proposed management changed in 31 cases (22.5%). When the management did not change, the confidence in the MNOB final decision was increased in 87 cases (81.3%). Step 1 had a sensitivity, specificity and accuracy of 83%, 58% and 66% and step 2, 86%, 64% and 71% respectively.

Conclusion: [¹⁸F]FDOPA PET adds significant information for the follow-up of HGG patients in clinical practice. When MRI findings are not straightforward, it can change the management for more than 20% of the patients and increases the confidence level of the multidisciplinary board decisions.

Keywords: Diagnostic efficacy; Glioblastoma recurrence; High-grade gliomas recurrence; Patients' management; [¹⁸F]FDOPA PET.

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