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IMAGE OF THE MONTH

Brain [^{18}F]FDG-PET as a marker of disease activity in a case of CASPR2 limbic encephalitis

Sara Cornacchini[1,2] · Alice Monaci[3,4] · Mattia Schiavolin[1,2] · Eleonora Rosati[2] · Luca Massacesi[1,2] · Valentina Berti[3,4] · Valentina Damato[1,2]

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The role of brain [^{18}F]fluoro-deoxy-glucose positron emission tomography ([^{18}F]FDG-PET) in the diagnosis of autoimmune encephalitis is becoming increasingly significant, due to its higher sensitivity compared to brain magnetic resonance imaging (MRI) [1]. However, data on the clinical utility of brain [^{18}F]FDG-PET in monitoring treatment response and relapse occurrence are still limited.

A 60-year-old man developed CASPR2 limbic encephalitis characterized by focal left temporal epileptic seizures, anhedonia and severe short-term memory impairment. During the acute phase, while brain MRI was normal, brain [^{18}F]FDG-PET showed intense left mesial temporal hypermetabolism. Sequentially treatment with corticosteroids, plasmapheresis and rituximab led to a dramatic clinical improvement but drug-resistant focal epilepsy, mood and memory disturbances persisted (consistent with extensive neuropsychological tests). According to the symptoms, in the following years, follow-up brain [^{18}F]FDG-PET scans showed a progressive decrease of the left mesial temporal metabolism. Four years after disease onset, the patient experienced increased epileptic seizures and severe memory deficits. Again, while brain MRI was normal, brain [^{18}F]FDG-PET showed new bilateral mesial temporal hypermetabolism. Sequentially treatment with corticosteroids, cyclophosphamide and tocilizumab led to a reduction of the symptoms corresponding to a decreased hypermetabolism at the [^{18}F]FDG-PET scan. The semiquantitative analysis of the metabolic activity of the temporo-mesial lobe regions was consistent with the different stages of disease, showing an increased metabolism of [^{18}F]FDG-PET during acute phase and relapses and a normalization of metabolism in association with therapy response and symptoms remission. Our experience supports the use of [^{18}F]FDG-PET as a useful tool to measure disease activity and evaluate treatment response in the management of anti-CASPR2 encephalitis, as already described in other type of autoimmune encephalitis [2].

✉ Sara Cornacchini
sara.cornacchini@unifi.it

1 Department of Neurosciences, Psychology, Drug Research and Child Health (NEUROFARBA), University of Florence, Florence, Italy

2 Department of Neurology 2, Careggi University Hospital, Florence, Italy

3 Department of Biomedical Experimental and Clinical Sciences Mario Serio, Florence, Italy

4 Nuclear Medicine, Careggi University Hospital, Florence, Italy

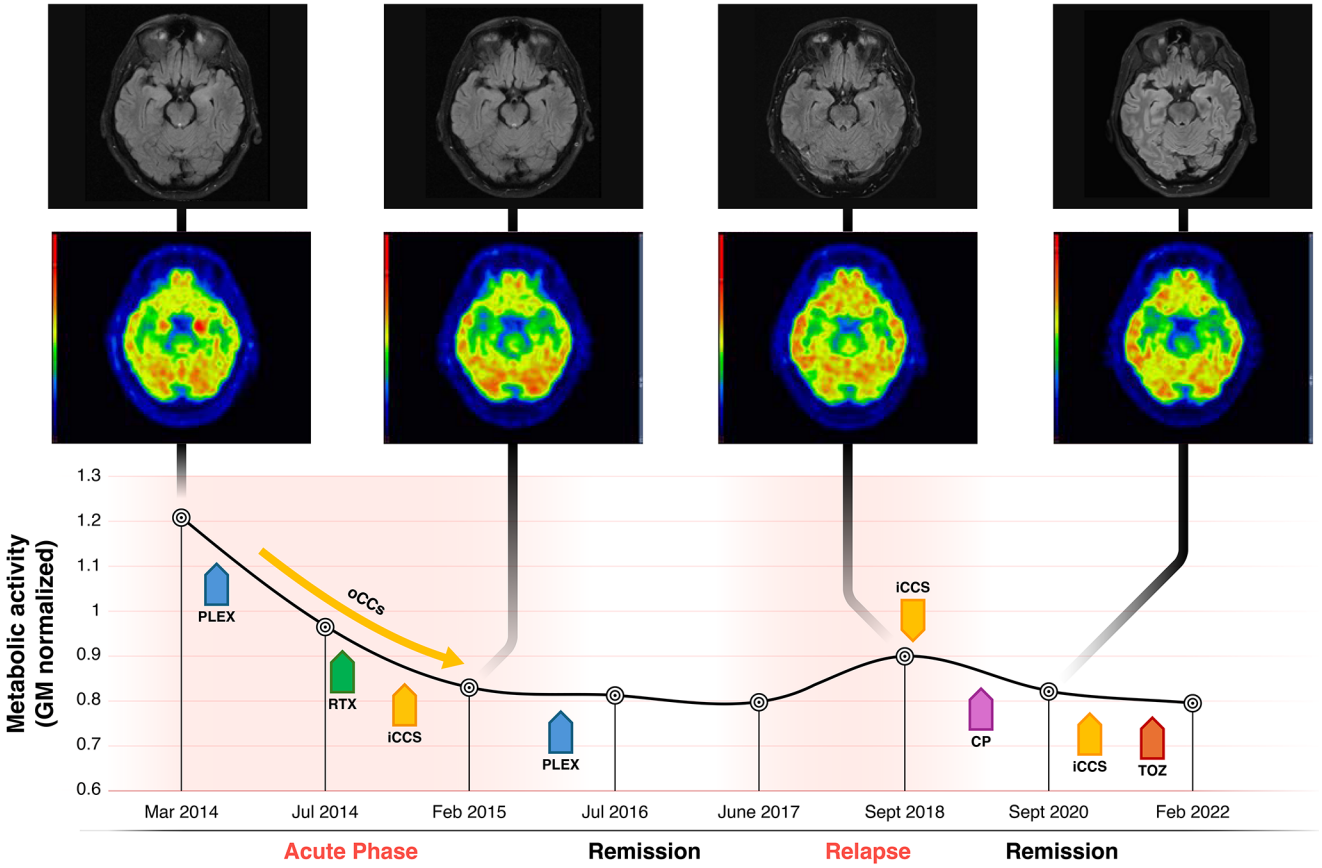

Fig. 1 Semi-quantitative analysis of the metabolic activity observed in [^{18}F]FDG-PET at consecutive disease timepoints, with relative MRI scans and immunotherapies administered. Abbreviations: [^{18}F]FDG-PET = fluorodeoxyglucose-positron emission tomography; GM = grey matter; PLEX = plasmapheresis; RTX = rituximab; iCCS = intravenous corticosteroids; oCCS = oral corticosteroids; CP = cyclophosphamide; TOZ = tocilizumab

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Data availability All data generated or analysed during this study are included in this published article.

Declarations

Competing interests The authors have no relevant financial or non-financial interests to disclose.

Written informed consent Written informed consent was obtained from the patient.

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