The utility of FDG-PET imaging in distinguishing PML-IRIS from PML in a patient treated with natalizumab

Aravindhan Baheerathan, MRCP,* Cillian McNamara, MBBCh, BAO,* Sabrina Kalam, BMBS, Neil Rane, FRCR, Tara D. Barwick, FRCR, Helen Grote, MRCP, and Richard Nicholas, FRCP

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Correspondence

Dr. Baheerathan
a.baheerathan89@
gmail.com

Figure T2-weighted MRI, T1-weighted contrast-enhanced image, and FDG-PET image

A 57-year-old woman with highly active relapsing-remitting multiple sclerosis (MS) treated with natalizumab developed dysarthria and right-sided hemiparesis. MRI demonstrated T2 hyperintensity (figure, A). CSF JC virus DNA titers were >1.1 M and progressive multifocal leukoencephalopathy (PML) was diagnosed. Natalizumab treatment was withdrawn.

*These authors contributed equally to this work as joint first authors.

From the Departments of Neurology (A.B., S.K., H.G., R.N.), Neuroradiology (C.M., N.R.), and Nuclear Medicine (T.D.B.), Charing Cross Hospital, Imperial College NHS Trust, London, UK.

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Four weeks later, bulbar weakness and left-sided hemiparesis developed despite falling JC virus titers. Repeat MRI raised the possibility of either deteriorating PML or PML-immune reconstitution inflammatory syndrome (IRIS) (figure, B and C). FDG-PET confirmed relative hypometabolism at the original site of PML and hypermetabolism in the left pons and middle cerebellar peduncle (figure, D), suggestive of PML-IRIS. Prednisolone was commenced with consequent disease stabilization.

Early treatment with steroids can be critical in blunting inflammation in PML-IRIS; however, their use may be associated with reduced JC virus clearance and subsequent exacerbation of PML. It can be challenging on MRI to distinguish among PML, PML-IRIS, and new MS activity. Thus, FDG-PET, in cases where there is doubt, can provide information to guide therapeutic decisions in this complex clinical context.

Author contributions

A.B.: wrote initial manuscript, subsequent editing and drafting. C.M.: selected images, figure legends, subsequent editing and drafting of manuscript. S.K.: reviewed initial manuscript, formatting and subsequent editing. N.R.: reviewed images and figure legends (MRI). T.D.B.: reviewed images and figure legends (nuclear medicine). H.G.: reviewed manuscript, involved in editing, drafting, and formatting. R.N.: overall manuscript review and senior author, primary supervisor of paper, final editing.

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