



Severe posterior hypometabolism but normal perfusion in a patient with chronic fatigue syndrome/myalgic encephalomyelitis revealed by PET/MRI

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Received: 17 September 2018 / Accepted: 25 November 2018 / Published online: 14 December 2018
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Chronic fatigue syndrome/myalgic encephalitis (CFS/ME) is a complex clinical condition defined by prolonged severe fatigue without medical or psychiatric causes, and by a subset of symptoms that mostly includes arthromyalgias, cognitive impairment, sleeping troubles, and unusual headaches [1]. Previous FDG-PET studies showed unspecific patterns of hypometabolism in the frontal and cingulate cortex in half of CFS patients compared to healthy controls [2].

We present ¹⁸F-FDG PET/MRI findings in a 21-year-old woman who fulfilled the criteria of CFS with a Fukuda score of 4. PET images (a) show severe and extensive hypometabolism in the posterior cortical regions (precuneus, parietal, temporal, and occipital), amygdalo-hippocampal complexes, and cerebellum. No structural abnormalities were found on T1 MPRAGE (b) or T2 FLAIR (c) MRI sequences. Interestingly, cerebral

blood flow evaluated with Gadolinium first-pass method (d) was not decreased in these regions.

This peculiar pattern of hypometabolism was recently described in a large series of patients with aluminium-induced macrophagic myofasciitis (MMF) followed in our reference center [3]. However, the present patient had negative muscular biopsies for MMF. Neuropsychological testing showed severe impairment of short-term memory (immediate and working memory) in visual modality, and weakness of visual selective attention and executive functions, which are concordant with the pattern of hypometabolism. Finally, perfusion-metabolism uncoupling suggests that posterior hypometabolism may not be related to neuronal loss such as in degenerative diseases [4], but rather to an inflammatory or immunological process [5]. Further studies are warranted to investigate metabolism and perfusion using simultaneous PET/MRI in larger groups of patients with CFS/ME.

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Author's contribution SS and EI devised the rationale and designed the original article.

EI, AL and JH supervised the study.

SS, PK and EI analyzed and interpreted the data.

MAS, MA and FJA collected the clinical information and the biopsy results.

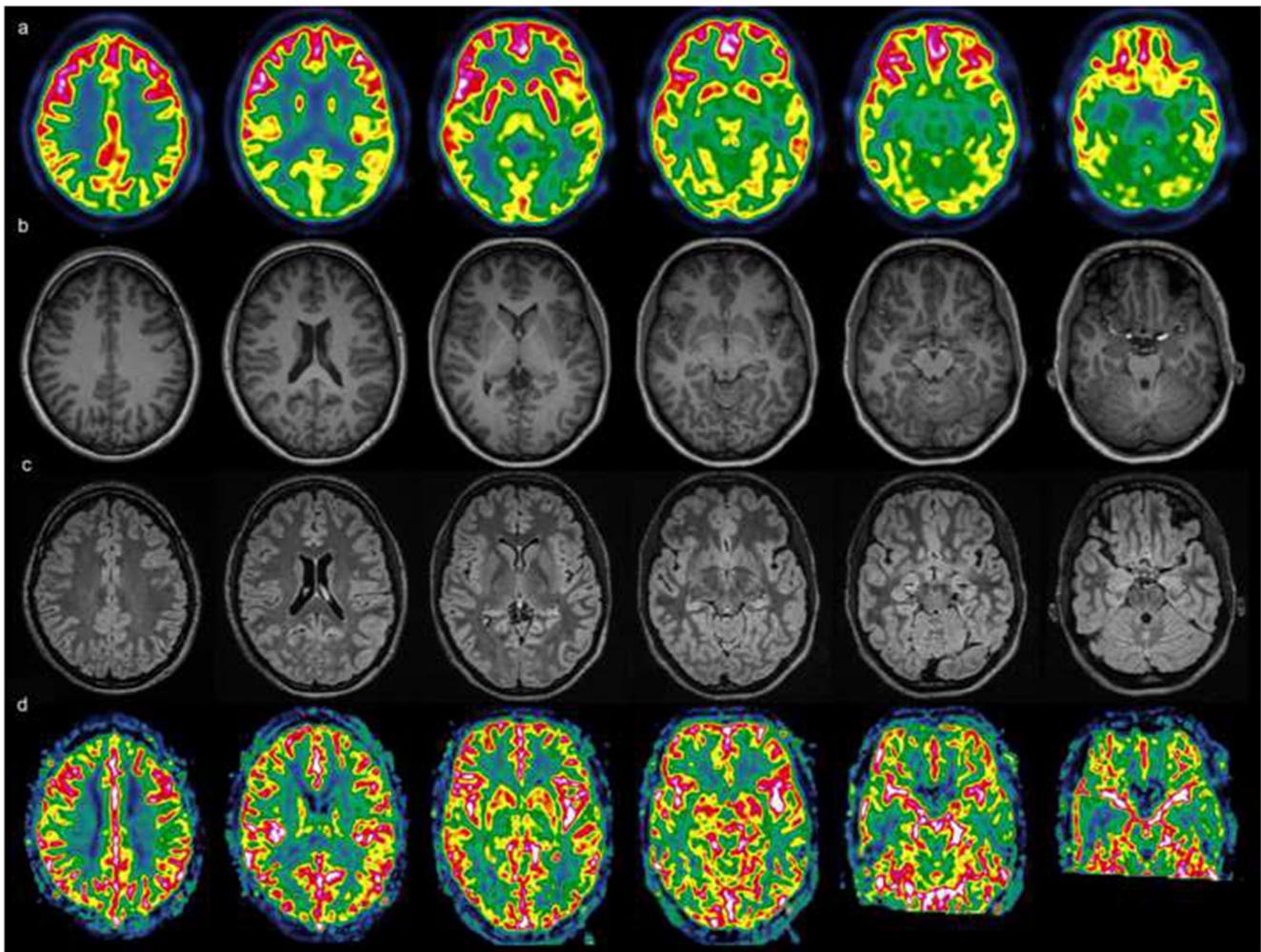
SS, EI, PK, PBD and BE participated in manuscript writing, editing, and revision.

All authors have read and approved the final version of the present manuscript.

Funding This study was not funded by any official grants.

Compliance with ethical standards

Conflicts of interest All the authors declare that they have no conflict or potential conflict of interest.



Ethical approval This article does not contain any studies with animals performed by any of the authors. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the principles of the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from the patient for the anonymous use of patient clinical, imaging, and histologic data. This study was approved by the Institutional Review Board (Comité de Protection des Personnes Ile-de-France VI, Hôpital Pitié-Salpêtrière, Paris, France).

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