Is 18F-FDG PET a 'potentially hazardous' or an effective tool in evaluating patients with large-vessel vasculitis?

Sirs,

We read with great interest the article of Luqmani regarding possible targets in the diagnosis of vasculitis (1). We would like to comment on some statements of this distinguished author about the role of PET imaging in large-vessel vasculitis (LVV).

Luqmani reported that *"there are problems of repeat PET procedures involving expense and radiation in patients with vasculitis"*.

About the costs, we are well aware that PET imaging is an expensive diagnostic tool, in particular if compared with other imaging modalities, such as ultrasonography (US). However, in the era of health technology assessment (HTA), the costs of a diagnostic procedure should be weighed against its effectiveness in the clinical setting. With specific regard to the effectiveness of PET imaging in LVV, several articles have demonstrated the superiority of 18F-FDG-PET or PET/CT over conventional imaging methods (such as US or magnetic resonance imaging [MRI]), as summarised in a recent systematic review (2).

Because of its ability to visualise the entire vascular tree with one scan, 18F-FDG PET/CT is particularly useful in the evaluation of atypical patients with LVV, including those with fever of unknown origin and polymyalgia rheumatica (where perisynovitis of the shoulders and subclinical vasculitis may be detected) or in patients with giant cell arteritis (GCA) and negative temporal artery biopsy (3).

18F-FDG PET or PET/CT findings correlate with clinical and laboratory markers of inflammation, in particular C-reactive protein. Moreover, 18F-FDG PET may also provide prognostic information in LVV such as in patients with GCA (3). On the other hand, importance of this investigation is not yet fully established in documenting disease activity in those patients with LVV receiving corticosteroids and/or immunosuppressive therapy.

A recent study by Fuchs *et al*., involving a panel of experts including Luqmani, reported that 18F-FDG-PET is a sensitive and specific imaging tool for LVV, especially when performed in patients not receiving immunosuppressive drugs. This diagnostic method increases the overall diagnostic accuracy and has an impact on the clinical management in a significant proportion of patients with LVV (3).

Unfortunately, to date, no studies demonstrating the cost-effectiveness of PET imaging in the evaluation of LVV have been published. Therefore, while we can state that 18F-FDG PET is an effective diagnostic tool in the management of patients with LVV, we lack sufficient data to state that 18F-FDG PET is cost-effective in evaluating LVV.

About the radiation dose, we recognise the potential risk attached to the use of ionising radiation exposure; in this regard, morphological imaging methods (such as US and MRI) are safer than PET imaging. On the other hand, it should be considered that some diagnostic and relevant information could be obtained by PET imaging only, influencing the management of patients with LVV in a significant proportion of cases (2, 4). In particular, functional information provided by 18F-FDG PET (such as changes of glucose metabolism in the vessel walls of patients with LVV undergoing pharmacological treatment) usually precede morphological changes detected by conventional imaging methods (2). Again, the potential risks related to radiation exposure in patients undergoing PET imaging should be weighed against the effectiveness of 18F-FDG PET in the clinical management of LVV.

However, beyond radiation exposure and costs, some limitations of 18F-FDG PET or PET/CT should be underlined such as the lower spatial resolution (this method is not able to evaluate small-vessel vasculitis) and the relatively lower availability compared to other imaging modalities.

The usefulness of 18F-FDG PET or PET/CT in patients taking immunosuppressive therapy and the ability of this imaging modality in assessing treatment response and in predicting major long-term complications in LVV, such as aortic dissection, should be further evaluated (3).

In conclusion, we believe that performing 18F-FDG PET or PET/CT in patients with LVV could provide important information if added to conventional imaging methods. Further studies are warranted to evaluate the potential improvement in the clinical outcome of LVV by the additional use of 18F-FDG PET or PET/CT and the related cost-effectiveness.

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Competing interests: none declared.

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