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FDG-PET/CT in inflammatory disorders : State-of-the-Art, Challenges and Next Frontiers

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Over the last twenty years, [18 F]FDG-PET/CT emerged as a day-to-day useful tool for assessing inflammatory and infectious disorders due to the expression of glucose transporters on various cells involved in the process, mainly neutrophils, the monocyte-macrophage family and fibroblasts.

Despite a lack of specificity, [18 F]FDG-PET/CT has the advantage of allowing whole-body functional imaging together with anatomical localization and details. In inflammatory diseases, [18 F]FDG-PET/CT was best validated by meta-analyses (MA) in polymyalgia rheumatica (PMR), large-vessel vasculitis

(LVV), sarcoidosis and inflammatory bowel disease (IBD).

In LVV, the pooled sensitivity ranged between 82 and 84% in two MA (range 61-93%) with a pooled specificity of 79 and 87% (range 60-96%). The negative likelihood ratio was remarkably low (0.20-0.23) allowing to rule out the diagnosis with a high degree of confidence. Several grading systems were described for both LVV and cranial giant cell arteritis. In the latter, the pooled sensitivity was lower (58%), probably due to limited spatial resolution. However, specificity was very high (97%). Limited data are available on the potential of [18 F]FDG-PET/CT for treatment monitoring. Diagnostic performances in PMR are encouraging considering that LVV and PMR represent a disease continuum. In sarcoidosis, [18 F]FDG-PET/CT showed efficient in the diagnosis, disease extent, assessment of pulmonary disease activity, and to a lesser extent, monitoring of therapeutic response. No meta-analysis is available up to now, except in cardiac sarcoidosis in which pooled sensitivity and specificity are both 84% with a very low negative likelihood ratio (0.20). [18 F]FDG-PET/CT has an established role in several guidelines for the assessment of suspected cardiac sarcoidosis, provided appropriate acquisition protocols are used.

The use of [18 F]FDG-PET/CT in IBD showed highly sensitive (85%) and specific (87%) to assess disease extent and early response to therapy in limited numbers of patients but requires specific bowel preparation.

Other indications include the recent use of [18 F]FDG-PET/CT in IgG4 related disorders (IgG4-RD) and retroperitoneal fibrosis (RPF), and rheumatic diseases. [18 F]FDG-PET/CT showed promising results in limited numbers of patients with IgG4-RD and RP by aiding to diagnosis and evaluation of disease extent but also by providing prognostic information and treatment response assessment. Experience in rheumatology has more focused on the evaluation of research questions.

Author: JAMAR, François (Cliniques universitaires St-Luc and UCLouvain, Brussels, Belgium)

Presenter: JAMAR, François (Cliniques universitaires St-Luc and UCLouvain, Brussels, Belgium)

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