B-1293 14:00
Whole-body MRI with DWI in lesion detection, staging and response evaluation in FDG-avid lymphomas: comparison with 18F-FDG-PET/CT

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Purpose: To assess diagnostic capability of WB-MRI with DWI in lesion detection, staging and response evaluation in FDG-avid lymphomas, namely Hodgkin lymphoma (HL) and diffuse large B-cell lymphoma (DLBCL), in comparison with PET/CT.

Methods and Materials: 16 patients with histologically proven HL and DLBCL underwent both 18F-FDG-PET/CT and WB-MRI with morphological sequences and DWI (b values=0-50-1000) for initial staging and for treatment response evaluation. For each patient, 30 nodal and extra-nodal stations were evaluated. We assessed diagnostic accuracy of WB-MRI in comparison with PET/CT for Ann Arbor staging. We also assessed sensitivity, specificity, PPV, NPV and accuracy of WB-MRI in nodal and extra-nodal lesion detection, and concordance between the two imaging modalities in evaluating response to therapy. Gold standard was represented by PET/CT and concordance between the two modalities was assessed with Cohen's kappa.

Results: Sensitivity, specificity, PPV, NPV and accuracy for nodal and extra-nodal lesions were respectively 93.7, 96.3, 85.4, 95.8 and 93.8% for WB-MRI with a very good agreement with PET/CT (k=0.81). Although these differences, there was a perfect agreement (16/16) between WB-MRI and PET/CT in Ann Arbor staging. At the end of treatment WB-MRI and PET-CT demonstrated excellent agreement in evaluating response to therapy (k=0.92) with only two discordant cases.

Conclusion: WB-MRI with DWI, compared to PET/CT, showed a very good agreement and diagnostic accuracy in staging and therapy response assessment of FDG-avid lymphomas, and has the potential to be a “radiation-free” alternative modality in these patients.

B-1294 14:08
Whole-body MRI, FDG-PET/CT and bone marrow biopsy, for the assessment of marrow involvement in patients with newly diagnosed lymphoma

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Purpose: To compare whole-body MRI (WB-MRI) with diffusion-weighted imaging (DWI), FDG-PET/CT, and bone marrow biopsy (BMB), for the evaluation of bone marrow involvement (BMI) in patients with newly diagnosed lymphoma.

Methods and Materials: Two independent radiologists and one nuclear medicine specialist reviewed all WB-MRI and FDG-PET/CT scans prospectively performed on 104 patients with newly diagnosed lymphoma (53 males; 47 Hodgkin; mean age: 44, range 15-86) between 2013 and 2015. The delay between imaging scans and BMBs was up to 10 days. The diagnostic accuracy of WB-MRI (1.5 Tesla MR scanner, with T1w, T2w-STIR and DWI sequences) was evaluated using BMB and FDG-PET/CT as the reference standard. We applied Cohen's kappa coefficient to assess the inter-observer agreement in WB-MRI interpretation and to compare WB-MRI, FDG-PET/CT and BMB. The Student’s t test was done to compare pelvic marrow ADC values of patients with positive and negative BMB. A p-value of <0.01 was considered significant.

Results: Inter-observer agreement was excellent (k=0.937). Agreement between WB-MRI and FDG-PET/CT was excellent, with a k=0.935. Agreement between WB-MRI and BMB was moderate (k=0.489), and fair between FDG-PET/CT and BMB (k=0.370). WB-MRI and FDG-PET/CT were falsely negative in four indolent non-Hodgkin lymphomas with BMI=30% of marrow cellularity. Conversely, WB-MRI and FDG-PET/CT detected all cases with a BMI>30% of marrow cellularity. Mean ADC values in patients with positive and negative BMB were not significantly different (p=0.049).

Conclusion: WB-MRI and FDG-PET/CT are valuable tools for the assessment of BMI.