

MEETING ABSTRACT

Open Access

# Imaging patients with breast and prostate cancers using combined $^{18}\text{F}$ NaF/ $^{18}\text{F}$ FDG and TOF simultaneous PET/ MRI

Andrei Iagaru\*, Ryogo Minamimoto, Mehran Jamali, Amir Barkodhodari, Sanjiv Sam Gambhir, Shreyas Vasanaawala

From PSMR 2015: 4th Conference on PET/MR and SPECT/MR  
La Biodola, Isola d'Elba, Italy. 17-21 May 2015

Stanford University, Department of Radiology, Division of Nuclear Medicine and Molecular Imaging, USA

Here we prospectively compared the combined  $^{18}\text{F}$  NaF/ $^{18}\text{F}$  FDG PET/ MRI against  $^{99\text{m}}\text{Tc}$ -MDP in patients with breast and prostate cancers. Twelve patients referred for  $^{99\text{m}}\text{Tc}$ -MDP bone scans were prospectively enrolled from Oct 14 - Jan 15. The cohort included 6 men with prostate cancer and 6 women with breast cancer, 41 – 85 year-old (average  $63 \pm 15$ ).  $^{18}\text{F}$  NaF (0.7-2.2 mCi, mean: 1.33 mCi) and  $^{18}\text{F}$  FDG (3.9-5.2 mCi, mean: 4.6 mCi) were subsequently injected from separate syringes. The PET/ MRI was done 6-12 days (average  $9.3 \pm 3.2$ ) after bone scan. The whole body MRI protocol consisted of T2-weighted, DWI, and contrast-enhanced T1-weighted imaging. Lesions detected with each test were tabulated and the results were compared. All patients tolerated the PET/MRI exam, and PET image quality was diagnostic despite the marked reduction in the administered dosage of radiopharmaceuticals (80% less for  $^{18}\text{F}$  NaF and 67% less for  $^{18}\text{F}$  FDG). Five patients had no bone metastases identified on either scans. Bone scintigraphy and PET/MRI showed osseous metastases in 7 patients, but more numerous bone findings were noted on PET/MRI than on bone scintigraphy in 3 patients. Lesions outside the skeleton were identified by PET/MRI in 2 patients. The combined  $^{18}\text{F}$  NaF/ $^{18}\text{F}$  FDG PET/MRI is superior to  $^{99\text{m}}\text{Tc}$ -MDP scintigraphy for evaluation of skeletal disease extent. Further, it detected extra- skeletal disease that may change the management of these patients, while allowing a significant reduction in radiation exposure from lower dosages of PET radiopharmaceuticals administered. A combination of  $^{18}\text{F}$  NaF/ $^{18}\text{F}$  FDG PET/MRI may provide the most accurate staging of patients with breast and prostate cancers prior to the start of treatment.

Published: 18 May 2015

doi:10.1186/2197-7364-2-S1-A65

Cite this article as: Iagaru et al.: Imaging patients with breast and prostate cancers using combined  $^{18}\text{F}$  NaF/ $^{18}\text{F}$  FDG and TOF simultaneous PET/ MRI. *EJNMMI Physics* 2015 **2**(Suppl 1):A65.