

Combined imaging modalities may change cancer management

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PET/CT and whole-body MRI detect extraskeletal disease that may change the management of high-risk breast and prostate cancer patients, according to a recent study reported in the December issue of *The Journal of Nuclear Medicine*. In addition, the combined administration of F-18 sodium fluoride (NaF) and F-18 fluorodeoxyglucose (FDG) in a single PET/CT scan showed significantly higher sensitivity and accuracy than alternative methods for the detection of skeletal lesions.

Prostate cancer and [breast cancer](#) are among the most prevalent forms of cancer in the United States, according to statistics from the American Cancer Society. For prostate cancer, about 220,800 new cases were predicted for 2015, as well as 27,540 deaths. For breast cancer, about 231,840 new cases were predicted for 2015, as well as 40,240 deaths.

Andrei H. Iagaru, MD, FACNM, corresponding author of this Stanford University study, explained, "Using results from previous studies, this project attempts to identify the most appropriate approach for identifying lesions in selected breast and prostate cancer patients who are at high risk of developing metastatic disease." Iagaru is co-chief of Stanford's Division of Nuclear Medicine and Molecular Imaging and co-director of its PET-MRI Research Program.

The study compared results of the combined use of F-18 NaF/F-18 FDG PET/CT in patients with breast or prostate cancers with those obtained using Tc-99m MDP bone scintigraphy (BS) and whole-body MRI (WBMRI). Thirty patients (15 women with breast cancer and 15 men

with [prostate cancer](#)) referred for standard of care BS were prospectively enrolled in the study. NaF/FDG PET/CT and WBMRI were performed following BS. This preliminary study found that NaF/FDG PET/CT is significantly more accurate in detecting skeletal lesions than WBMRI and Tc-99m MDP scintigraphy. In addition, NaF/FDG PET/CT and WBMRI detected extra-skeletal disease that may change the way treatment is managed for these patients..

Iagaru points out, "The combined administration of NaF/FDG in a single PET/CT scan provides appropriate staging of high-risk patients with prostate (higher than stage II or PSA higher than 10) or breast (higher than stage III) cancers, but WBMRI may be beneficial, particularly for brain and liver metastases detection." He adds, "While bone scintigraphy will continue to be used as the initial tool for skeletal metastases detection due to low cost and high performance, evaluation of patients with negative-equivocal bone scans and high clinical suspicion for metastases will be done using combined modalities that may simplify the diagnostic algorithm for referring physicians and patients."

Iagaru considers molecular imaging and [nuclear medicine](#) techniques to be at the forefront of advancing patient care. Looking ahead, he notes, "More work remains to be done, and our group is now exploring the use of combined NaF/FDG injections with state of the art PET/MRI technology for significant decreases in radiation exposure and improved diagnostic performance in accurately evaluating extent of disease in [cancer patients](#)."

More information: Prospective Comparison of 99mTc MDP Scintigraphy, Combined 18F-NaF and 18F-FDG PET/CT and Whole-Body MRI in Patients with Breast and Prostate Cancers, *The Journal of Nuclear Medicine*, 2015.

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