

## INTRODUCTION

Breast cancer is the leading cause of cancer related death in women and the fifth leading cause of mortality worldwide. Bone metastases is the most frequent site of dissemination. Prevention of morbidity from metastases to bone requires accurate, early diagnosis for preliminary staging, planning of treatment, treatment monitoring, restaging and prediction of survival in patients with breast cancer. Many centres in South Africa still mostly make use of <sup>99m</sup>Tc-MDP bone scintigraphy in the staging work-up of these patients, likely due to the relatively low cost, availability, and physician familiarity with this imaging modality. <sup>18</sup>F-FDG PET/CT scans are more sensitive in detecting lytic lesions and purely marrow involvement. Additional soft tissue involvement can also be detected using this imaging modality.

## OBJECTIVES

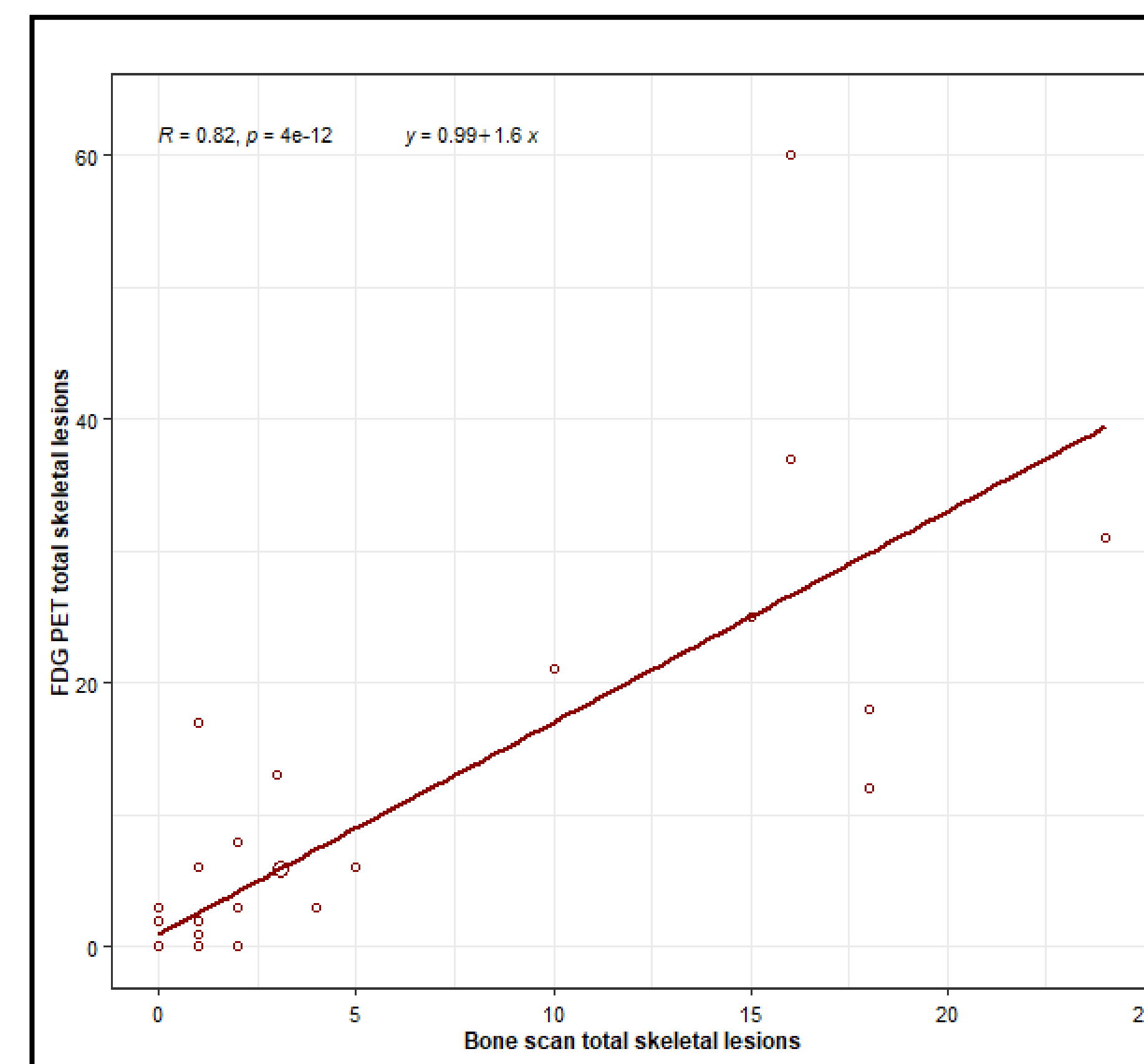
The aim of this cross-sectional study is to compare the detection of suspected metastatic skeletal lesions in both <sup>99m</sup>Tc-MDP bone scintigraphy and <sup>18</sup>F-FDG PET/CT scans as well as its impact on management.

## METHODS

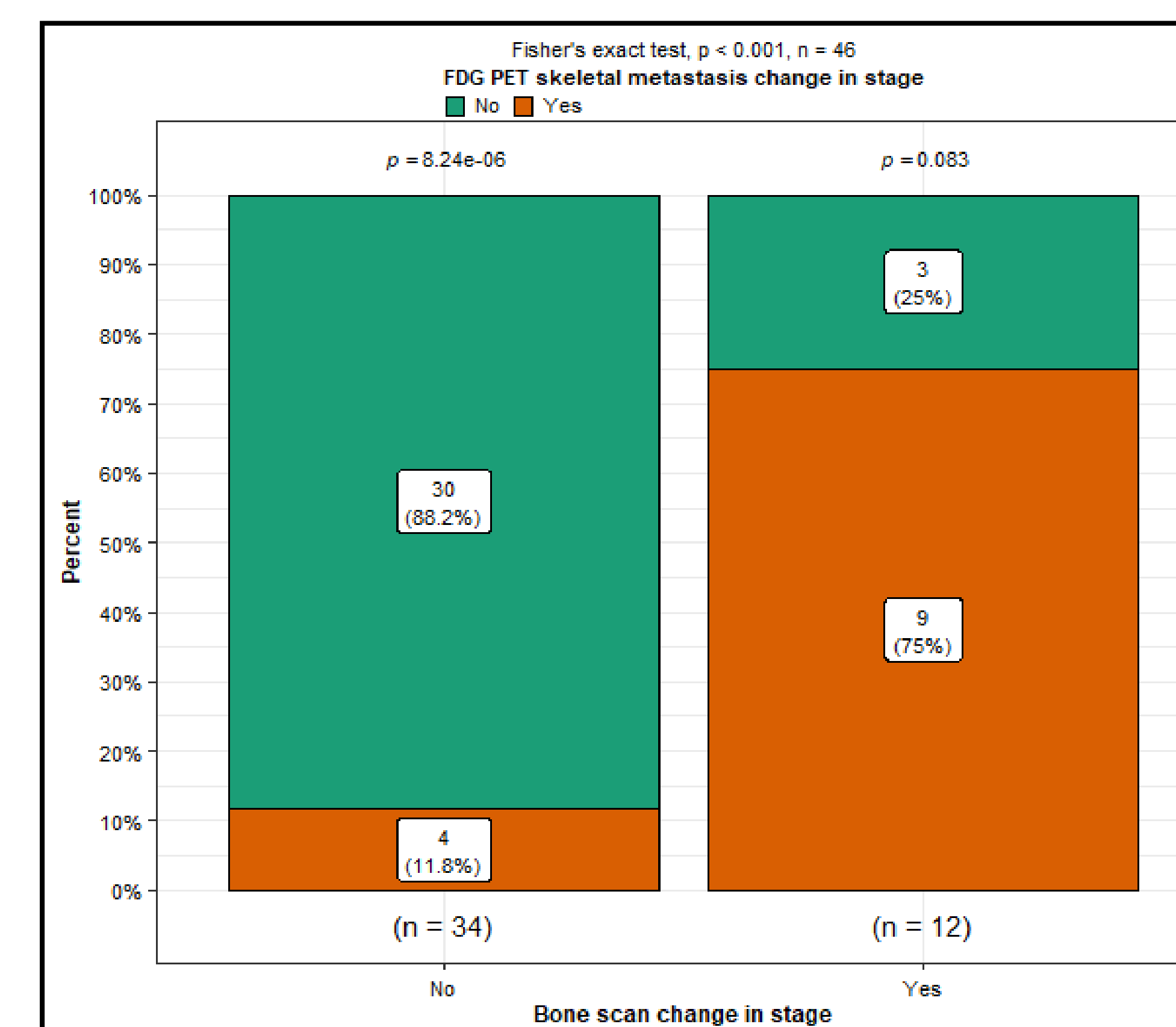
Forty-six (n=46) breast cancer patients with a mean age of 52 years, underwent a <sup>18</sup>F-FDG PET/CT scan and a <sup>99m</sup>Tc-MDP bone scintigraphy performed within 31 days. Comparison was done based on a lesion-by-lesion analysis. The results of the image interpretation were compared retrospectively. Any change in stage and management was recorded.

## RESULTS

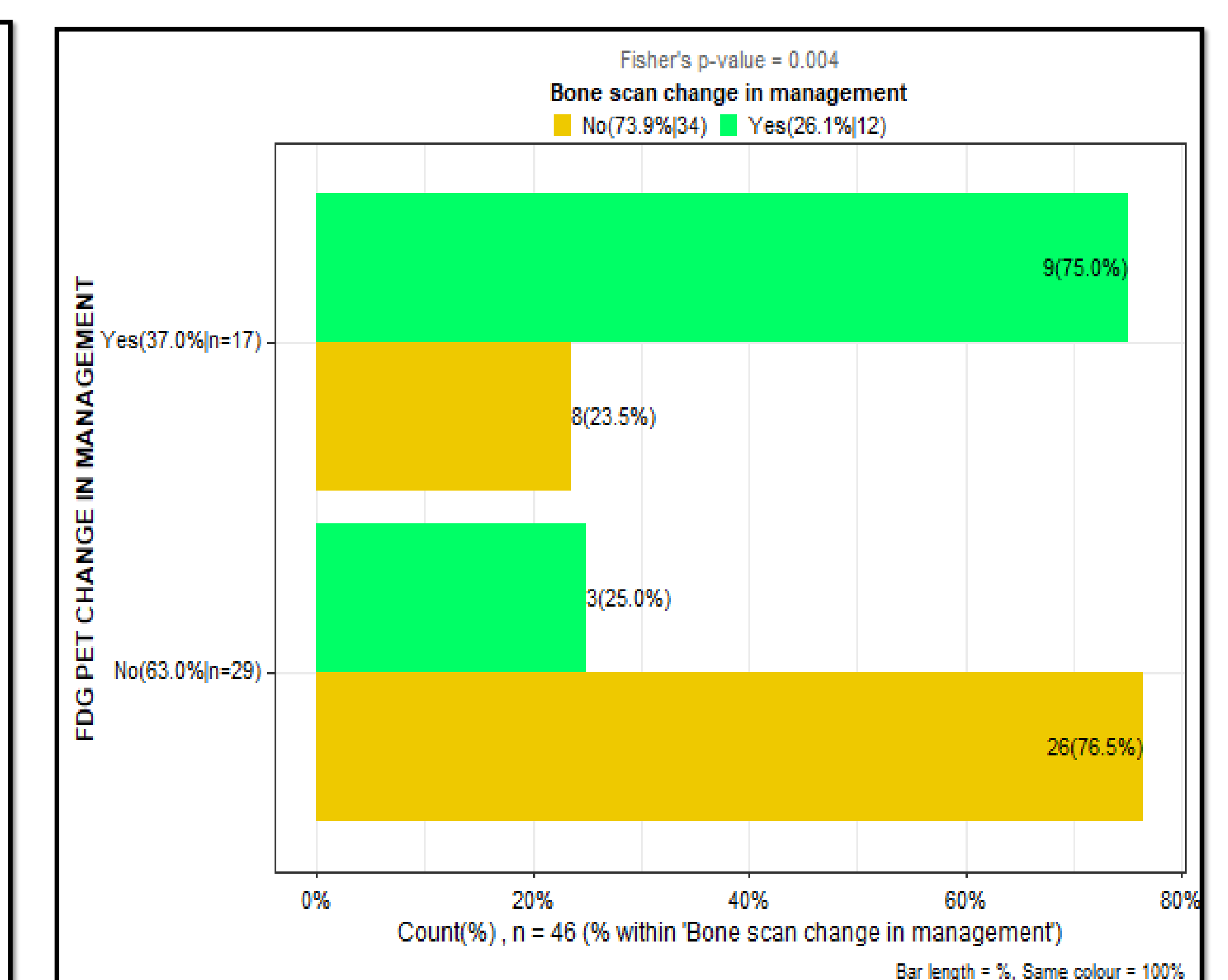
A total of 142 lesions were detected on <sup>99m</sup>Tc-MDP bone scintigraphy and 237 lesions were detected on <sup>18</sup>F-FDG PET/CT scans which led to a change in management of 12 patients with <sup>99m</sup>Tc-MDP bone scintigraphy and 17 patients with <sup>18</sup>F-FDG PET/CT scans. Of the forty-six (46) patients, 76% (n=35) of patients had invasive ductal carcinoma (IDC), 13% (n=6) had invasive breast cancer no specific type 4(IBC-NST), 4.3% (n=2) had invasive lobular cancer (ILC) and 6.5% (n=3) of patients had missing histological results. In 1/46 (2%), an osteoblastic lesion was detected on the <sup>99m</sup>Tc-MDP bone scintigraphy that was negative on <sup>18</sup>F-FDG PET/CT scan, and which resulted in a change in management. This patient had triple positive IDC. With regards to tumour stage(T), 63% (n=29) had T4 lesions, 17% (n=8) had T3 lesions, 15% (n=7) had T2 lesions and 4% (n=2) had T1 lesions.



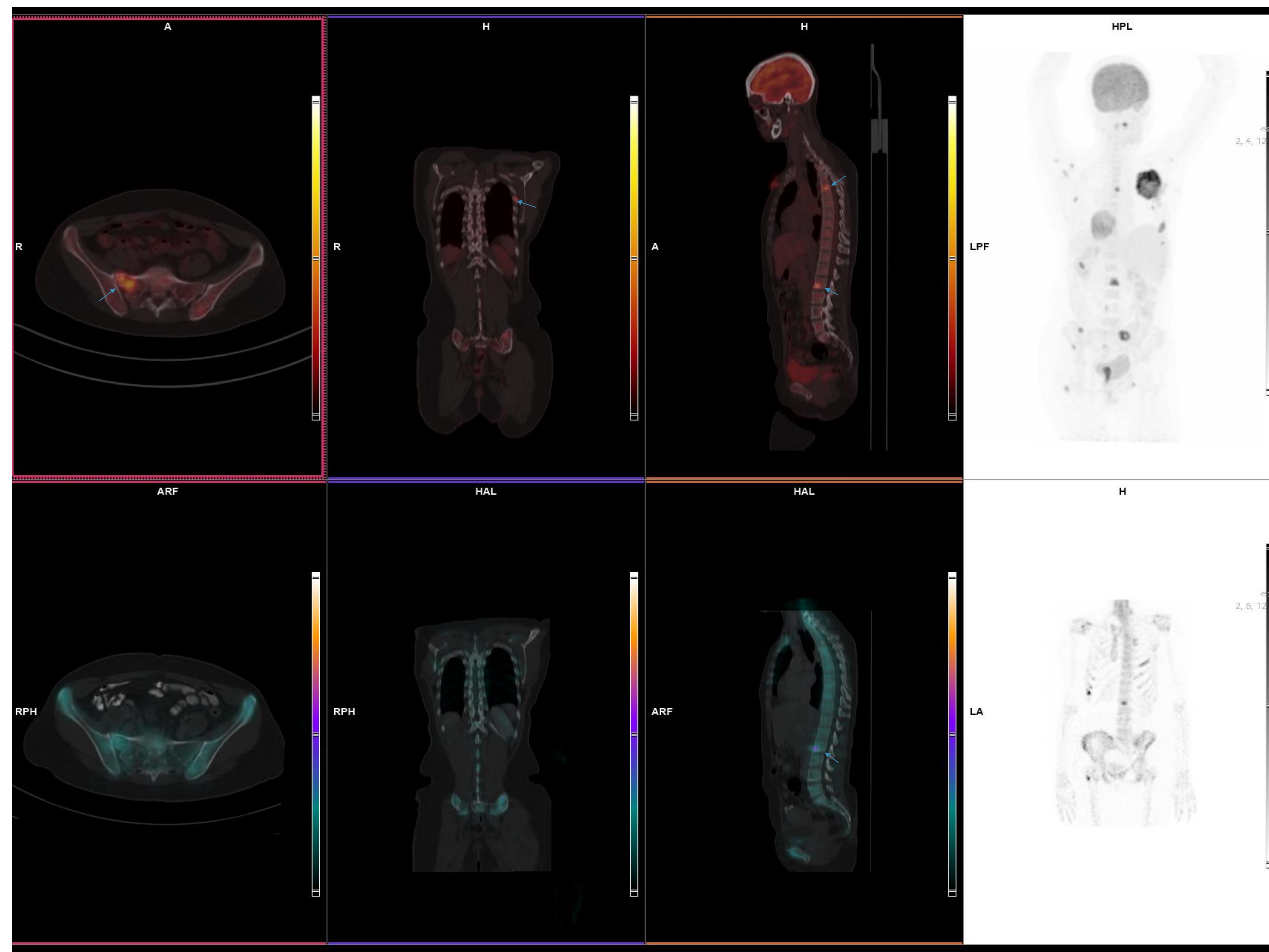
TOTAL SKELETAL LESIONS DETECTED ON BONE SCAN VS <sup>18</sup>F-FDG PET/CT



CHANGE IN STAGE



CHANGE IN MANAGEMENT



43 YEAR OLD FEMALE DIAGNOSED WITH BREAST CANCER. IMAGES DEMONSTRATING MORE SKELETAL LESIONS ON FDG PET/CT (ROW ABOVE) IN COMPARISON TO BONE SCAN (ROW BELOW)

## CONCLUSION

<sup>18</sup>F-FDG PET/CT scans proved to be the superior modality in detecting skeletal metastases and other soft tissue distant metastases resulting in a significant number of patients having a change in management in comparison to <sup>99m</sup>Tc-MDP bone scintigraphy.

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