First results of molecular imaging (FDG and FES) in prospective study for selecting second line hormonotherapy in estrogen receptors positive metastatic breast cancer patients

B. Maucherat, A. Leduc-Pennec, N. Fleury, Ludovic Ferrer, E. Bourbouloux, H. Simon, M. Le Thiec, D. Rusu, V. Fleury, M. Colombie, et al.

OP-284

First results of molecular imaging (FDG and FES) in prospective study for selecting second line hormonotherapy in estrogen receptors positive metastatic breast cancer patients

B. Maucherat[1], A. Leduc-Pennec[2], N. Fleury[3], L. Ferrer[4,5], E. Bourbouloux[6], H. Simon[7], M. Le Thiec[1], D. Rusu[1], V. Fleury[1], M. Colombie[1], A. Morel[1], F. Kraeber-Bodere[1,5], L. Campion[8,5], C. Rousseau[1,5];

[1]ICO Cancer Center, Nuclear Medicine Unit, Saint Herblain, FRANCE, [2]University Hospital, Nuclear Medicine Unit, Brest, FRANCE, [3]ICO Cancer Center, DRCI, Saint Herblain, FRANCE, [4]ICO Cancer Center, Physics Unit, Saint Herblain, FRANCE, [5]CRCINA, University of Nantes, INSERM UMR1232, CNRS-ERL6001, Nantes, FRANCE, [6]ICO Cancer Center, Oncology Unit, Saint Herblain, FRANCE, [7]University Hospital, Oncology Unit, Brest, FRANCE, [8]ICO Cancer Center, Biometrics, Saint Herblain, FRANCE.

Aim/Introduction: About 70% of primitive breast cancers had positive estrogen receptors (ER) and may benefit from hormonotherapy. However, ER expression in breast cancer metastases is heterogeneous and about 15% of metastases lost this expression over time. Biopsies were not possible systematically. 16α-18Fluoro-17β-Oestradiol (^{18}FES) is a radiopharmaceutical which predict the response to the first line hormonotherapy. The aim of this prospective study (NCT03442504) was to determine the predictive value of PET at the patient level, before a second line hormonotherapy (2nd-HT) on the FDG response obtained at 6 weeks of treatment.
Materials and Methods: We prospectively included 12 ER+ metastatic breast cancer patients, HER2 negative, in progression despite first line hormonotherapy. For the complete study, 60 patients will be included. Due to 2nd-HT proposed by oncologist, we performed ^{18}FES PET-CT (^{18}FES-BL) and ^{18}FDG PET-CT (^{18}FDG-BL) at baseline in the month before the new treatment introduction. Follow-up with ^{18}FDG PET-CT and CT

were performed to detect treatment response, particularly with a first FDG PET-CT at 6 weeks (^{18}FDG-6W). Semi-quantitative data were extracted from ^{18}FES-BL, ^{18}FDG-BL and ^{18}FDG-6W, and compared to the progression free survival (PFS) during the 2nd-HT treatment, among which SUVmax and adapted thresholded Total Tumour Volume (TTV). **Results:** At breast cancer diagnosis, 6 patients (50%) had lymph node metastases and 5 (41,6%) had visceral metastases. After first line hormonotherapy, only one patient had no positive FES (FES+) lesion while more than 40 FDG positive (FDG+) lesions were detected. Eleven patients (91,6%) had between 3 and more than 40 FES+ lesions. Three patients (25%) had more FES+ lesions than FDG+ lesions, 4 patients (33,3%) had more FDG+ lesions than FES+ and 5 patients (41,7%) had as many FES+ lesions as FDG+. Despite the 2nd-HT started, no significant result was found for the semi-quantitative data outside a likely poor prognosis of ^{18}FDG-BL TTV (p=0.079). We noted a trend for a better PFS when the ^{18}FES-BL TTV was greater or equal to the ^{18}FDG-BL TTV. Comparing ^{18}FDG-BL and ^{18}FDG-6W, a ^{18}FDG-BL TTV greater or equal to the ^{18}FES-BL TTV seemed predict the stability or progression of the ^{18}FDG-6W TTV. **Conclusion:** ^{18}FES PET-CT seemed to be interesting for the 2nd-HT response prediction. These results must be confirmed with the the following study patients. **References:** None.