

imaging (preclinical and clinical)

83P Repeatability evaluation of PET/CT imaging using [18F] fluorothymidine (FLT) and [18F]fluorodeoxyglucose (FDG) in primary triple negative breast cancer (TNBC)

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Introduction: Pathological response to neo-adjuvant chemotherapy in TNBC is an independent predictor of survival. PET/CT imaging of proliferation & metabolism is of interest for early response but response criteria need defining. The test-re test performance of PET/CT in TNBC is unknown, the optimal SUV response parameter is unclear and it is likely EORTC and PERCIST criteria overestimate response. TNPET01 is a 2 part phase II imaging feasibility and response prediction study in TNBC intended to relate baseline and therapy induced changes in PET tracers after 1 cycle of neoadjuvant docetaxel to mid and end-of-treatment MRI, biopsy and pCR to

sequential taxane-anthracycline. Part A (presented here) provides baseline repeatability assessment prior to selection of a single tracer for further response evaluation in part B.

Methods: 10 patients with T2 TNBC and planned neoadjuvant chemotherapy were randomised to FLT or FDG imaging prior to and in week 3 after cycle 1 docetaxel. Patients had 2 scans at baseline. Dynamic imaging was followed by static scans at 90, 120, 180 mins (FDG) or 90 mins (FLT). SUV max, mean, peak & SULpeak were measured using HERMES software. Repeatability was evaluated by Bland Altman plots of the pre-chemotherapy log-transformed SUV/SUL measurements.

Results: 9 patients completed part A (5FDG, 4FLT), 1 patient withdrew. Mean interval between baseline scans was 3.7 days (s.d 0.7). 3 patients had axillary nodal uptake (2FLT, 1FDG). SUVmax and mean were evaluable in all patients. Baseline SUV and SUL peak were non-evaluable in 2 FDG imaged tumours despite clinical size >2cm. On per-patient analysis, repeatability coefficients for FDG were 15% for SUVmax and SUVmean. FLT repeatability coefficients were 13% and 14% for SUVpeak and SULpeak but 25% for SUV max and 20% for SUVmean. PET scans at day 17 ± 3 after the first docetaxel cycle showed a drop of >20% in all SUV parameters in patients with CR/PR or SD (8/9 patients).

Conclusion: Repeatability coefficients for FDG & FLT in TNBC are within ±15%. 2 FDG imaged breast tumours were not evaluable with SULpeak. The more widely used SUVmax may be a better parameter for tumour evaluation in TNBC.

Clinical trial identification: EUDRACT 2011-004220-34

Disclosure: All authors have declared no conflicts of interest.