Van Damme N., De Bruyne S., Ferdinande L., Ceelen W., Smeets P., Mertens J., Van de Wiele C., Laurent S., Geboes K., Peeters M. FDG-PET is a predictor of metabolic response to chemotherapy in metastatic colorectal cancer patients (mCRC). Annals of Oncology 2011; 22 (S5): V92. 13th World Congress on Gastrointestinal Cancer, June 2011, Barcelona, Spain, P-0257

Background: Bevacizumab prolongs overall survival and progression-free survival (PFS) when added to standard chemotherapy. The purpose of the study was to explore the possible role of FDG-PET as response predictor for bevacizumab treatment and the prognostic value of CEA, Ki-67 and MVD expression in liver mCRC patients.

Methods: Eighteen mCRC patients were treated with Folfox or Folfiri and bevacizumab. FDG-PET scans were performed before treatment (baseline) and median 15 days after cycle 5 (follow-up). The most representative liver lesion was used as target lesion. PET results were quantified by calculating SUVmax at baseline and follow-up. Biopsies of the liver metastasis (n=5) were taken. Seven weeks after the last chemotherapy, 16 patients underwent surgical resection of the liver metastasis. The biopsy and resection sections samples were stained for Ki-67 and for MVD (CD31). MVD is expressed as the total number of vessels divided by the number of x400 high power fields. Ki-67 is expressed as the mean percentage. CEA levels were measured before and at the end of chemotherapy. PFS was defined as the time from start of treatment to the date of first documented disease progression.

Results: Median PFS was 10 months (95% CI: 8.51-11.49). The median baseline SUVmax was 5.18 (IQR: 3.61-8.42) and median follow-up SUVmax was 2.93 (IQR: 2.15-5.94; p=0.025). Following EORTC criteria, FDG-PET revealed a complete metabolic response in 8 patients (44%), partial metabolic response in 3 (17%), stable metabolic disease in 3 (17%) and progressive metabolic disease in 4 (22%). Correlation between metabolic response and radiological response according to RECIST was as follows: 6 of the 8 patients with radiological response had metabolic response (sensitivity 75%) and 5 out of 10 patients with radiological stable or progressive disease were metabolic nonresponders (specificity 50%). Using the Cox proportional hazards model, the follow-up SUVmax (HR 1.33, 95% CI 1.00-1.77, p=0.05) showed a trend towards significant prediction of PFS. The Kaplan-Meier log rank test showed a PFS benefit for patients with >30% reduction in their SUVmax (p=0.02). The median CEA level was 24.3 ng/mL (IQR: 2.6-106) at baseline and 10.2 ng/mL (IQR: 3-34; p=0.012) after chemotherapy. For the 4 patients having both biopsy and resection specimen, the median number of vessels decreased from 9.1 to 5 and percentage Ki-67 positive cells increased from 53.2% to 74%. Ki-67 is significantly correlated with %necrosis of the tumour (r=0.719, p=0.004). The biomarker levels were not different between the responders and nonresponders as determined either by RECIST or metabolic response. Univariate cox regression analysis showed that neither MVD (HR=1.049; p=0.19), Ki-67 (HR=0.994; p=0.85) nor CEA showed a significant relationship with PFS. However, the Kaplan-Meier log rank test showed a PFS benefit for patients with higher MVD (p=0.055).

Conclusion: The use of FDG-PET for therapy monitoring is clinically feasible and the follow-up SUVmax seems to be a promising predictor of PFS. Our results suggest that MVD could be a prognostic factor of progression in mCRC patients who underwent curative liver surgery.