

SCIENTIFIC SESSION PRESENTATION

Open Access

# Therapy response assessment with quantitative PET: evaluation of a shortened acquisition protocol with dynamic PET/CT

C Pfannenber <sup>\*</sup>, SC Schüle, C Brendle, J Schwenck, K Nikolaou, C La Fougère, J Kupferschläger

From International Cancer Imaging Society (ICIS) 14th Annual Teaching Course Heidelberg, Germany. 9-11 October 2014

## Purpose

The results of SUV quantification for prediction of histopathological response in patients with oesophageal carcinoma show high variations with different accuracy. However, the routine use of a full dynamic PET is limited because of long acquisition times. We tested a shortened acquisition protocol for quantitative PET to overcome that limitation.

## Material and methods

13 patients with histopathologically proven oesophageal adenocarcinoma underwent a combined dynamic and static <sup>18</sup>F-FDG PET/CT including CT tumour perfusion (Siemens, Biograph mCT). Dynamic PET (listmode) was acquired for 60 min resulting in 38 frames from 10 to 600 sec duration for the full dynamic dataset and 2 frames each with 600 sec duration (20-30 min and 50-60 min p.i.) for dual time point PET (DTP). We evaluated the metabolic rate  $K_i$  using different models: 2-compartment irreversible model (Fit), Patlak plot and DTP (van den Hoff *et al*). The CT tumour perfusion protocol included the parameters blood flow, blood volume and permeability.

## Results

The metabolic rate  $K_i$  could be reliably reproduced independent of the analytical model; we observed only slight variations of  $K_i$  with respect to the analytical model: -4,9% (Patlak vs.Fit), -10% (DTP vs.Fit) and -5,1% (DTP vs. Patlak). A linear regression revealed a strong correlation of the  $K_i$  values:  $R^2 = 0,996$  (Patlak vs. Fit),  $R^2 = 0,968$  (DTP vs.Fit) and  $R^2 = 0,985$  (Patlak vs. DTP).

## Conclusion

The shortened dynamic acquisition protocol of DTP-PET is a reliable method for the determination of the metabolic rate  $K_i$  and can substitute a full dynamic scan for improved quantitative assessment of therapy response.

Published: 9 October 2014

doi:10.1186/1470-7330-14-S1-S1

**Cite this article as:** Pfannenber *et al.*: Therapy response assessment with quantitative PET: evaluation of a shortened acquisition protocol with dynamic PET/CT. *Cancer Imaging* 2014 **14**(Suppl 1):S1.

### Submit your next manuscript to BioMed Central and take full advantage of:

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at  
[www.biomedcentral.com/submit](http://www.biomedcentral.com/submit)



\* Correspondence: [christina.pfannenber@med.uni-tuebingen.de](mailto:christina.pfannenber@med.uni-tuebingen.de)  
Department of Radiology, Eberhard-Karls-University Tuebingen, Germany