

Extended Abstract

Dual tracer FLT-FDG-PET/CT in the assessment of biological parameters for simulated treatment planning in patients with cervical cancer

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Aim: The assessment of metabolic activity and the extend of the tumor mass has an increasing importance for radiotherapy planning and patients prognosis. The aim of the study was to compare biological parameters of primary tumor assessed by 18F-FDG and 18F-fluorothymidine (FLT) positron emission tomography (PET)/computer tomography (CT) in patients with cervical cancer and influence on radiotherapy planning.

Materials & Methods: Respectively 39 women with histologically confirmed cervical cancer underwent dual tracer PET/CT examinations performed for radiotherapy. PET scans were acquired on separate days (within one week) 60 min after IV injection of 300 MBq of 18F- fluorodeoxyglucose (FDG) and 300 MBq of 18F-FLT. The reconstructed PET images were evaluated using a dedicated workstation for metabolic tumor parameters, such as SUVmax, metabolic tumor volume (MTV), total lesion glycolysis (TLG) and heterogeneity for primary tumor and compared using t-test.

Results: There was significant differences in the volumes calculated from FLT-gross tumor volume (GTV) and FDG-GTV (29.86 ± 25.17 vs. 37.10 ± 30.7 ; $p=0.02$). The SUVmax, TLG and heterogeneity were in general lower for FLT-GTV than FDGGTV (9.35 ± 10.06 vs. 11.46 ± 4.05 , $p=0.13$; 136.14 ± 138.59 vs. 281.48 ± 322.95 , $p=0.002$; 0.6 ± 0.05 vs. 0.63 ± 0.5 , $p=0.02$ respectively) however, in three patients SUV values for FLT-GTV were higher than for FDG-GTV. Depending on severity of the disease patients were divided into three groups.

Conclusion: In this limited study FLT-GTV tends to show lower measured volumes as a consequence of the lower thymidine uptake within tumor mass as compared to glucose metabolism. Our preliminary results found statistically significant differences between metabolic and volumetric parameters in patients with disease limited only to cervix and disease limited to the cervix and iliac lymph nodes either FDG or FLT.

Biography:

Paulina Cegla has completed her graduation at Poznan University of Medical Science, Poland in 2013 with a Master degree in Electroradiology. In 2017, she started her PhD at the same University. Since 2011 she is working as a Nuclear Medicine Radiographer in Department of Nuclear Medicine at Greater Poland Cancer Centre. She has presented over 20 scientific works in European and World Conferences of Nuclear Medicine and several articles in reputed journals.