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# Impact of PRRT with the use of 90Y/177LuDOTA-TATE to change of SUVs obtained in 68Ga-DOTA-TATE PET/CT in patients with neuroendocrine tumors – does the use of a theroanostic pair of radiopharmaceuticals may affect the estimation of survival after PRRT?

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Impact of PRRT with the use of 90Y/177LuDOTA-TATE to change of SUVs obtained in 68Ga-DOTA-TATE PET/CT in patients with neuroendocrine tumors – does the use of a theroanostic pair of radiopharmaceuticals may affect the estimation of survival after PRRT?

Introduction
Peptide receptor radionuclide therapy (PRRT) is an effective therapeutic option for metastatic neuroendocrine tumor (NET) therapy in case of good somatostatin receptor expression in tumors tissue. Despite significant progress in management of NETs, searching for novel predictive and prognostic factors is crucial. The high heterogeneity of the somatostatin receptors density in different NET metastatic lesions and inside single tumours probably influence an clinical outcome. Some up-to-date studies indicate that the response to PRRT assessed on the basis of imaging of somatostatin receptors may be a potentially useful tool for prediction of overall PRRT effect.

Aim
Assessment of corrected SUV max change in metastatic NET lesions associated with PRRT counted in [68Ga]Ga-DOTA-TATE PET/CT and its potential impact on long-term treatment outcomes.

Materials and Methods
Among all patients treated with PRRT using 177Lu or 177Lu/90YDOTA-TATE in 2017-2019 due to dissemination of G1 and G2 classifications neuroendocrine neoplasm, 13 patients who had 68Ga-DOTATATE PET/CT performed no longer than 6 months before and 6 months after PRRT. For all measurable metastatic lesions corrected SUVmax (taking into account individual for each patients SUV max of reference organs normal liver or spleen), mean value of SUV max in both PET/CTs (before and after PRRT) was calculated. Those results were correlated with clinical outcome of the disease assessed during follow-up one on the basis of other imaging studies as positive (stabilization (SD) or regression (PR)) or negative (progression (PD).

Results
The mean follow-up was 8.9months. PD was found in patients, PR or SD in 10 patients. Among patients with regression, a decrease in the mean value of corrected SUVmax in comparison to the baseline study of 277.12% was observed. Among patients with SD, a mean of corrected SUVmax in comparison to the baseline study decreased by 180.80%. Decrease in the mean value of corrected SUVmax in comparison to the baseline study in patients with regression and stabilization taken together was in average 209.85% Increased values were observed among progressive patients, where change of corrected SUVmax was in average 6.11%.

Conclusion
A decrease in the value of corrected SUVmax in metastatic lesions obtained from routine PET/CT tests with 68Ga-DOTA-TATE may indicate a lower risk of neuroendocrine tumor progression within a 9 months from the end of PRRT and may constitute an additional independent parameter helping to estimate the risk of progression in this group of patients.

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