A theranostic approach for adrenocortical neoplasia based on high adrenal CXCR4 expression.

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Abstract

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Objectives The chemokine receptor CXCR4 is a key factor for tumor growth and metastasis in several human cancers. Recently, [^{68}Ga]Pentixafor has been developed as a PET tracer specifically targeting CXCR4. The aim of this study was to evaluate the suitability of [^{68}Ga]Pentixafor for in vivo imaging of patients with adrenocortical carcinoma (ACC) and selecting potential patients for future CXCR4-directed treatments.

Methods 22 consecutive patients (12 female, 10 male; mean age 50.3±10.1 years) with histopathologically proven metastasized ACC were examined with [^{68}Ga]Pentixafor, a specific CXCR4 PET-ligand. Imaging results were compared to [^{18}F]FDG PET/CT.

Results Visual comparison of both tracers resulted in comparable findings in 7 (32%) patients. In 9 patients (41%) [^{18}F]FDG identified more lesions with visually higher uptake compared to [^{68}Ga]Pentixafor. In 2 patients (9%) [^{68}Ga]Pentixafor identified more metastatic lesions than [^{18}F]FDG, whereas in 4 patients (18%) [^{68}Ga]Pentixafor and [^{18}F]FDG provided complementary information regarding the number and intensity of lesions. Including patients history and the results of the [^{68}Ga]Pentixafor scan, 12 out of 22 patients (54%) were rated as suitable and 3 patients (14%) as potentially suitable peptide receptor radionuclide therapy (PRRT) with with [^{177}Lu]/[^{90}Y]-labeled Pentixafor analogs.

Conclusions CXCR4 is highly expressed in a subgroup of ACC patients potentially contributing to the malignant behaviour of this neoplasia. [^{68}Ga]Pentixafor-PET imaging provides excellent imaging quality and allows for selection of patients potentially qualifying for a CXCR4-directed PRRT.