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[68Ga]Ga-DPI-4452 PET/CT for staging of patients with clear cell renal cell carcinoma

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Background

Aim of this study was to evaluate diagnostic accuracy and impact on management of carbonic anhydrase IX imaging by [^{68}Ga]Ga-DPI-4452 (CAIX) PET/CT vs conventional CT in patients (pts) with Clear Cell Renal Cell Carcinoma (ccRCC).

Methods

From Jul 2024 to Apr 2025, 25 pts (63y, IQR 12y) with histologically confirmed ccRCC [initial staging n=1; restaging n=24 (locally advanced n=2, metastatic n=22)] were examined. 9/25 pts received systemic therapy at the time of PET/CT. PET/CTs were assessed by 2 nuclear medicine physicians, CT read was performed independently by a radiologist to evaluate region-based detection efficacy for primary tumor/recurrence and metastases. Inter-reader reproducibility was analyzed using Cohen's kappa (Tbl 1). Clinical impact was evaluated via pre-/post-imaging questionnaires completed by urooncologists.

Results

Mean injected activity of [68Ga]Ga-DPI-4452 was 104 MBq (uptake time x^{-} = 61 min), with no side effects observed at 3-month median follow-up. 3/25 pts (12%) showed no viable tumor; all underwent systemic therapy. In total 45 regions were detected by CAIX PET and/or CT (100%) in 22 pts. Of these, 98% were identified by CAIX PET/CT, 40% by CT alone. 1 region was CT-positive and CAIX-negative, a histologically confirmed lung metastasis. In 19 (42%) CAIX-positive regions, histological confirmation of tumor involvement was available, 7 of which were CT-negative. CAIX-PET/CT exclusively changed therapy managment in 7 pts; 1 case shifted to palliative intent. Mean SUVmax of all CAIX-positive regions was 74.8 ± 43.6. Highest uptake was found in bone metastases (mean SUVmax 139.2 ± 126.9). In 14 pts, most CAIX-positive regions showed SUVmax >20, suggesting investigation of potential therapy with [177Lu]Lu-DPI-4452.Table: 2597MO

Inter-reader reproducibility of [^{68}Ga]Ga-DPI-4452 PET/CT				
CAIX-positive region	Local tumor	Lymph nodes	Bone	Visceral
Cohen's Kappa	0.91 (0.74-1.0)	0.75 (0.49-1.0)	0.87 (0.61-1.0)	1.0 (1.0-1.0)

Conclusions

[^{68}Ga]Ga-DPI-4452 (CAIX) PET/CT is a promising imaging tool for ccRCC with superior detection compared to CT, high inter-reader reproducibility and substantial clinical impact. High SUV values indicate potential for a theranostic application.

Legal entity responsible for the study

University Hospital Essen.

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Disclosure

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