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The impact of baseline PSMA PET/CT vs. CT on outcomes of Radium-223 therapy in mCRPC patients

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Background

Imaging prior to Radium-223 therapy (Ra-223) is crucial for selecting metastatic castration-resistant prostate cancer (mCRPC) patients with bone-only disease. The purpose of this study was to evaluate if baseline PSMA PET/CT versus CT is associated with biochemical response during Ra-223.

Methods

A secondary analysis of the data of a prospective observational study (NCT04995614) was performed. Patients received a maximum of six cycles of Ra-223 and were retrospectively divided into the PSMA PET/CT (bPSMA) or CT (bCT) group based on baseline imaging technique. All patients received baseline bone scintigraphy. Primary endpoints were alkaline phosphatase (ALP) and prostate specific antigen (PSA) response, defined as ≥ 30% decline from baseline. Secondary endpoints were overall survival (OS) and radiological response.

Results

Between 2017 and 2020, 122 mCRPC patients were included: 18 (14.8%) in the bPSMA and 104 (85.2%) in the bCT group. All baseline characteristics were comparable. No significant differences in ALP or PSA response were found between the groups. The bCT group showed a significant shorter OS compared to the bPSMA group (12.4 vs.19.9 months, *p* < 0.01, table). Post-therapy soft tissue involvement (STI) was detected in 29/76 patients (38.2%) that received bCT and post-therapy CT (bCT/pCT), compared to 0/18 bPSMA patients. No significant difference in OS was found between bCT/pCT patients without STI and bPSMA patients. Table: 1823P

OS (months) among subgroups

Baseline imaging	Post-therapy imaging	N	Median OS (IQR)	P-value
PSMA	Total PSMA A. STI B. W/o STI CT	18 11/18 0/11 11/11	19.9 (12.7 – 29.0) - - 21.2 (14.7 – 40.8) - -	0.038 vs. bCT - - - - -
	C. STI D. W/o STI No imaging	4/18 0/4 4/4 3/18	20.3 (15.2 – 36.8) 4.9 (3.1 - NR)	
CT	Total PSMA A. STI B. W/o STI CT	104 7/104 6/7 1/7	12.4 (7.9 – 18.2) - 14.6 (11.5 – 24.9) 21.5	0.038 vs. bPSMA - - - - <0.01 vs. bCT/pCT w/o STI 0.457 vs. bPSMA - -
	C. STI D. W/o STI E. Unknown STI No imaging	76/104 29/76 44/76 3/76 21/104	(NR) - 10.6 (6.0 – 14.2) 14.8 (9.3 – 26.0) - 9.2 (4.0 – 12.9)	

Abbreviations: W/o, without; NR, not reached.

Conclusions

bPSMA versus bCT does not seem to predict biochemical response during Ra-223. Nevertheless, patients in the bCT group had a significantly shorter OS, most likely due to underdetection of STI in this group. Therefore, replacing baseline CT with PSMA PET/CT appears to be a valuable screening method to ensure in-label use of Ra-223.

Clinical trial identification

NCT04995614.

Legal entity responsible for the study

The authors.

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Disclosure

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