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 (223Ra) therapy is crucial for selecting metastatic castration-resistant prostate cancer (mCRPC) patients with bone-only disease.

PURPOSE
To evaluate if baseline PSMA PET/CT versus CT is associated with outcomes of 223Ra therapy.

METHODS
- Second analysis of a prospective observational study (NCT04995614).
- Patients received maximally 6 cycles of 223Ra.
- Retrospective allocation into baseline PSMA PET/CT (bPSMA) or CT (bCT) groups and post-therapy PSMA PET/CT (pPSMA) or CT (pCT) subgroups.
- All patients received baseline bone scintigraphy.
- Primary endpoints: alkaline phosphatase (ALP) and prostate-specific antigen (PSA) response.
- Secondary endpoints: overall survival (OS) and radiological response.

RESULTS
- 122 included patients between 2017-2020: 18 in the bPSMA and 104 in the bCT group (Fig.1).
- All baseline characteristics were comparable.
- No significant differences in ALP or PSA response.
- Median OS: bCT group 12.4 months vs. bPSMA group 19.9 months (p = 0.038, Fig.2).
- Newly detected lymph node and/or visceral metastases (soft tissue involvement, STI) post-therapy:
  - bCT/pCT: 31/76 patients (40.1%)
  - bCT/pPSMA: 6/7 patients (85.7%)
  - bPSMA/pPSMA: 0/11 patients (0%)
  - bPSMA/pCT: 0/4 patients (0%)
- No significant difference between bCT/pCT patients without newly detected STI post-therapy and bPSMA patients (Fig.2).

CONCLUSIONS
- Baseline PSMA PET/CT does not seem to impact biochemical response during 223Ra therapy.
- Patients in the bCT group had a significantly shorter OS, most likely due to underdetection of STI in this group.
- Replacing baseline CT with PSMA PET/CT appears to be a valuable screening method to identify the patients who will benefit most from radium-223 therapy.