

Baseline Inflammatory Biomarkers as Indicators of Biochemical Response to Lutetium-177 PSMA Therapy in Patients with Metastatic Castration-Resistant Prostate Cancer

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BACKGROUND

- Lu-177 PSMA radioligand therapy is an established treatment option for PSMA-positive metastatic castration resistant prostate cancer (mCRPC).
- Treatment response varies considerably among patients, highlighting the need to identify readily available biomarkers that may help predict treatment response and improve patient selection.
- Systemic inflammatory biomarkers derived from routine blood counts, including the neutrophil-to-lymphocyte ratio (NLR), platelet-to-lymphocyte ratio (PLR), monocyte-to-lymphocyte ratio (MLR), neutrophil-to-eosinophil ratio (NER), systemic immune-inflammation index (SII), pan-immune inflammation value (PIV), and haemoglobin-to-platelet ratio (HPR), have been investigated as potential prognostic markers in cancers including mCRPC.

STUDY OBJECTIVE

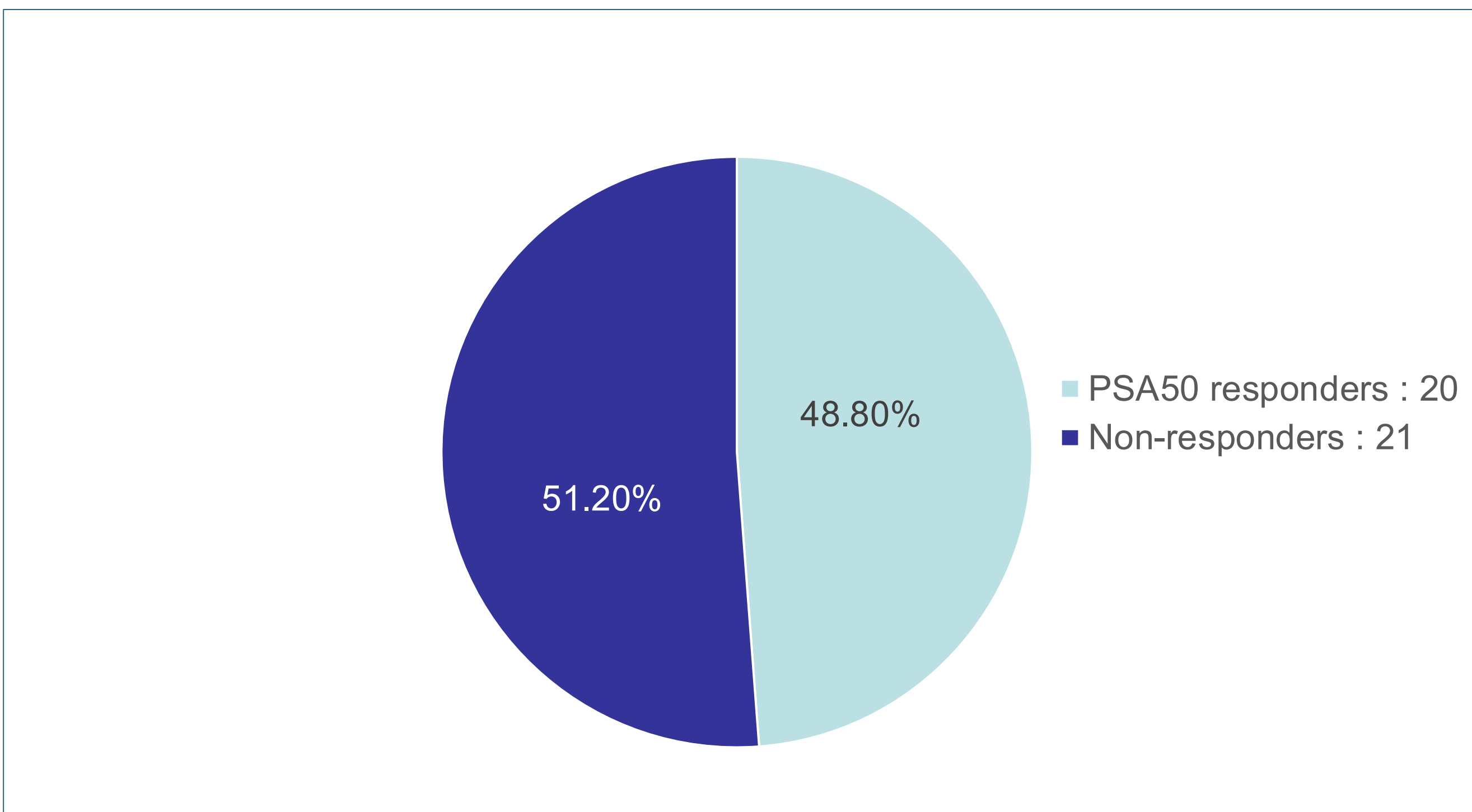
To evaluate if baseline inflammatory biomarkers are associated with PSA50 response(≥50% reduction in PSA from baseline) following 177Lu-PSMA therapy in patients with mCRPC.

METHODS

This is a retrospective study of 43 mCRPC patients in the department of Nuclear Medicine, SKMCH&RC, Lahore, from January 2023 to June 2026. 41 patients were included in the final analysis. 2 patients were excluded due to incomplete data. Eligible patients had mCRPC, had received at least one cycle of 177Lu-PSMA-617 therapy, and had baseline complete blood count and PSA data available. Comparison of 7 baseline inflammatory markers was made between PSA50 responders and non-responders.

PATIENT CHARACTERISTICS

Characteristic	Study population
Age, mean ± SD	69.0 ± 10.5
Previous hormonal therapy	41 (100%)
Previous surgery	25 (61.0%)
Previous radiotherapy	28 (68.3%)
Previous Taxane chemotherapy	30 (73.2%)



PRIMARY OUTCOME

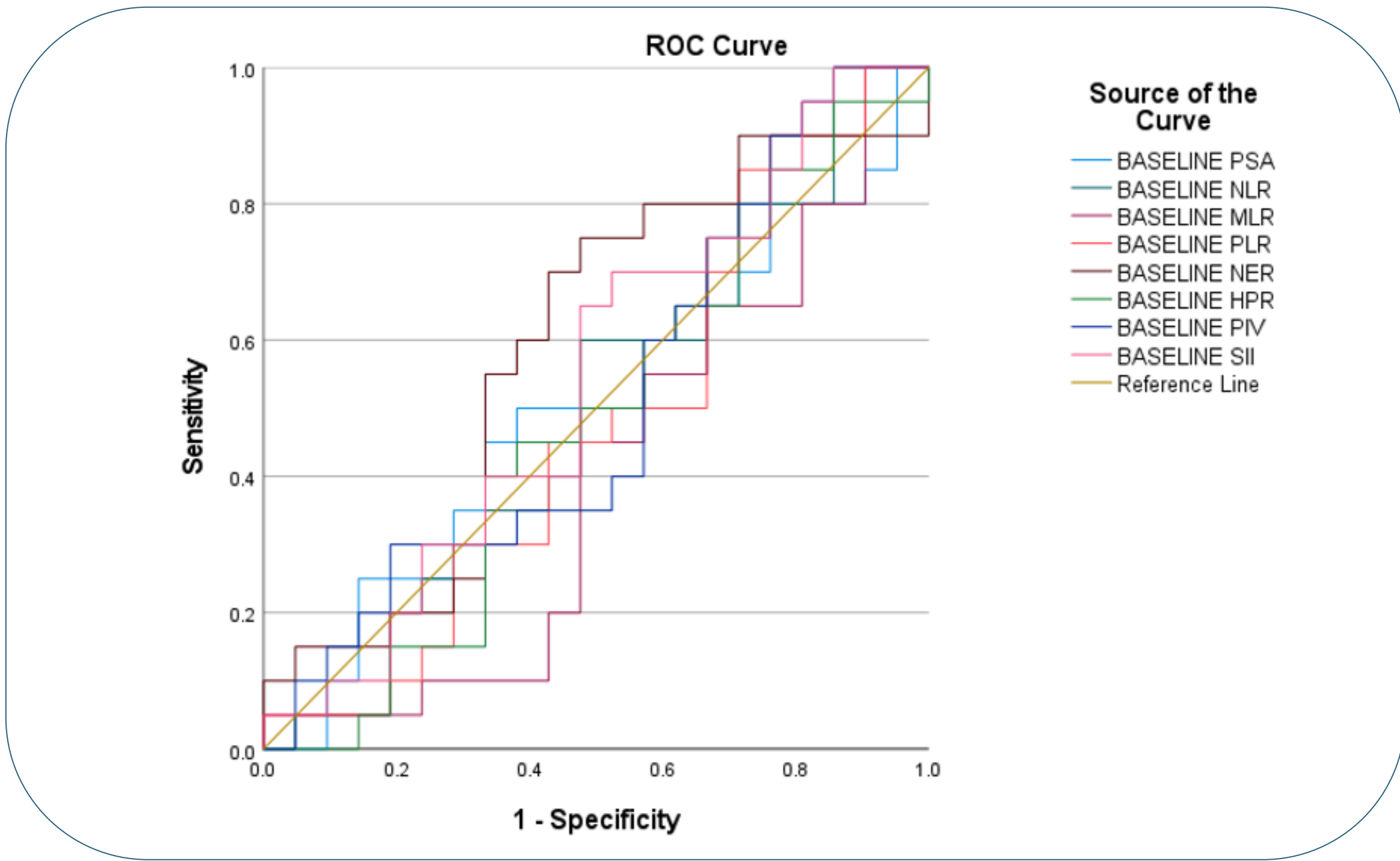
PSA50 response: ≥50% reduction in PSA from baseline at any point during treatment.

RESULT

Biomarkers	p-value
NLR	1.000
MLR	0.273
PLR	0.794
NER	0.334
HPR	0.814
SII	0.657
PIV	0.896

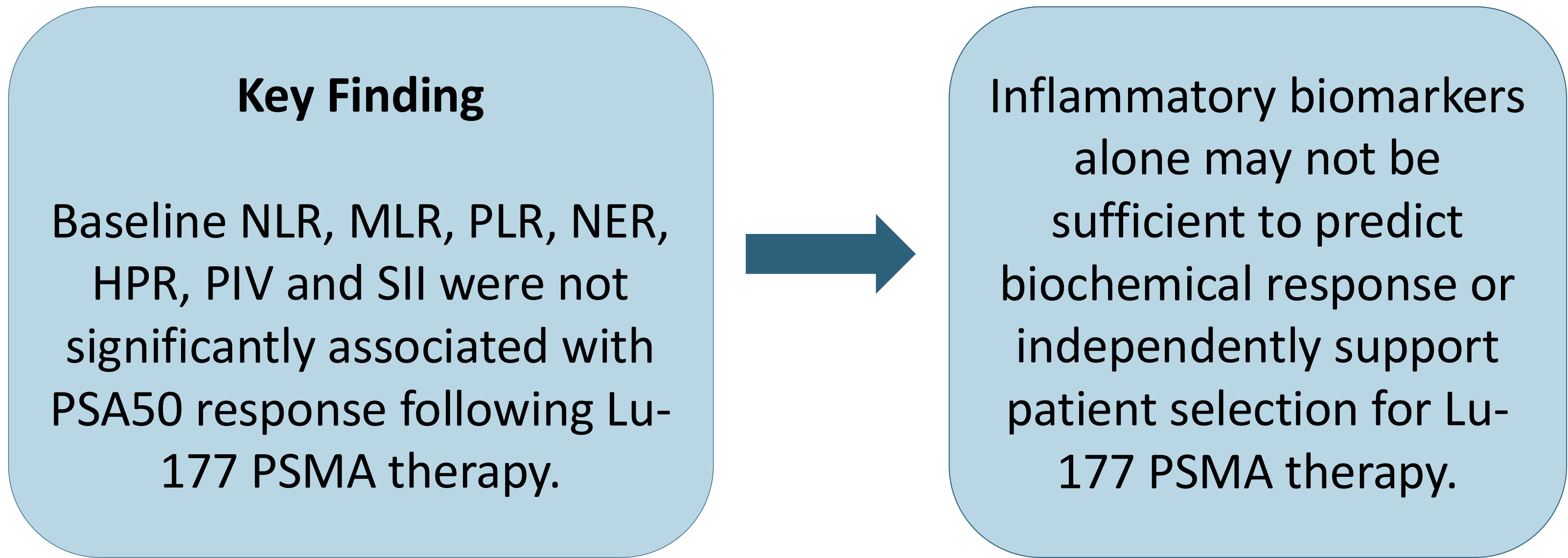
Multivariable logistic regression:

None of the seven biomarkers demonstrated a statistically significant independent association with PSA50 response after adjustment for age, baseline PSA and treatment cycles.



All AUCs were close to 0.50, indicating poor discrimination between PSA50 responders and non-responders.

CONCLUSION



LIMITATIONS

- Retrospective study
- Single-centre cohort
- Small sample size (n=41)

NEXT STEP

- Larger prospective, multi-centre studies

