Prognostic value of PSMA-PET against CHAARTED criteria in an ENZAMET sub-cohort

Z Sabahi [1], N Papa [2], W P. Fendler[3], A Nguyen[1], K Wong[1], N Ayati[1], B Ho[1], J Chen[1], T Cusick[4], I A. Burger[5], M Crumbaker[1], G Marx[6], S Sharma[1], M Frydenberg[7], S Sandhu[8], I D. Davis[9,10], M R. Stockler[11], C Sweeney[12], A M. Joshua[13,14], L Emmett[1, 2,14], The Australian and New Zealand Urogenital and Prostate Cancer Trials Group (ANZUP)

1. Theranostics and Nuclear Medicine Department, St Vincent's Hospital Sydney, Darlinghurst, New South Wales, Australia; 2. Garvan Institute of Medical Research, Darlinghurst, New South Wales, Australia; 3. Department of Nuclear Medicine, University of Duisburg-Essen and German Cancer Consortium (DKTK)-University Hospital Essen, Essen, Germany; 4. ANZUP Cancer Trials Group, Australia; 5. Department of Nuclear Medicine, Kantonsspital Baden, affiliated Hospital to the University of Zurich, Baden, Switzerland; 6. San Clinical Trial Unit, Sydney Adventist Hospital, Wahroonga, Australia; 7. Department of Surgery, Faculty of Medicine, Nursing and Health Sciences, Monash University, VIC, Australia; 8. Peter MacCallum Cancer Centre, Melbourne, VIC, Australia; 9. Department of Cancer Services, Eastern Health, Melbourne, VIC, Australia; 10. Eastern Health Clinical School, Monash University, Melbourne, VIC, Australia; 11. NHMRC Clinical Trials Centre, University of Sydney, New South Wales, Australia; 12. South Australian Immunogenomics Cancer Institute, University of Adelaide, Adelaide, SA, Australia; 13. Department of Medical Oncology, St Vincent's Hospital Sydney, Darlinghurst, New South Wales, Australia; 14. School of Clinical Medicine, University of New South Wales, Sydney, New South Wales, Australia.

1. Background & Rationale

CHAARTED criteria on CT and bone scan are an important prognostic biomarker in mHSPC that are used to guide treatment intensification. Clinicians are increasingly using PSMA PET/CT scans in lieu of conventional imaging for staging of prostate cancer, but PSMA PET/CT criteria for poor prognostic mHSPC are not yet defined.

2. Aim

To determine features on PSMA PET/CT that correlate to progression free and overall survival in the context of CHAARTED criteria in an ENZAMET sub-cohort.

3. Study Design

Design:

Retrospective analysis of the randomised phase III ENZAMET trial study cohort, NCT02446405).

Target Population:

ENZAMET included participants with mHSPC evident on CT and/or bone scan, randomly assigned (1:1) to receive testosterone suppression plus enzalutamide or a non-steroidal antiandrogen (NSAA).

We included ENZAMET participants who underwent PSMA PET/CT prior to study enrolment for this sub-study.

Sample Size:

100 participants (51 enzalutamide, 49 control NSAA) had a ^{68}GaPSMA-11-PET/CT prior to enrolment in ENZAMET at Australian trial sites.

4. Study Objectives

Primary:

To develop PSMA PET/CT-based criteria that stratify patients with mHSPC into prognostic groups.

Secondary:

To compare high volume vs low volume disease on standard imaging to findings on PSMA PET/CT.

Define quantitative volume of PSMA PET/CT disease that is equivalent to high volume disease on standard imaging.

Tertiary:

Correlate new PSMA PET/CT criteria for high volume disease to overall survival in the ENZAMET cohort.

5. Study Results

On PSMA PET/CT 19 participants had bone only disease, 37 LN only, 32 bone and LN and 6 visceral involvement. In 54 patients with bone involvement on PSMA PET/CT, 53 had concordant findings on bone scan and 74% of patients had low volume per CHAARTED conventional imaging criteria.

Median PSMA Total Tumor Volume (PSMA-TTV) in the study cohort was 28 mL (61 mL vs 22 mL in CHAARTED high vs low volume) with the highest PSMA TTV quartile (Q4) >71mL (Figure 1,2).

5-year PFS for PSMA TTV Q4 vs Q1-3 was 36% vs 61% (p=0.011), with HR per doubling of TTV = 1.19 (95%CI: 1.03 – 1.38). 5-year OS for PSMA TTV Q4 vs Q1-3 was 60% vs 74% (p=0.18) (Figure 3).

In the pts with CHAARTED criteria low volume mHSPC, the highest PSMA TTV quartile (Q4) was > 63 mL. 5-year PFS for PSMA TTV Q4 vs Q1-3 was 21% vs 61% (p<0.001) with the corresponding proportions for OS being 53% vs 74% (p=0.11) (Figure 4).

Baseline characteristics	N=100
Age at randomisation, years Median (IQR)	69 (64-73)
ECOG	
0	88
1	12
Volume of Disease (mL), CHAARTED criteria	
High	26
Low	74
Visceral Metastases	8
Metastatic status at first diagnosis	
M1 (synchronous)	36
M0 (metachronous)	51
MX	7
Unknown	6
Years from diagnosis (non-synchronous disease). Median (IQR)	4.0 (2.5-6.7)
Adult Comorbidity Evaluation score	
0-1	77
2-3	23

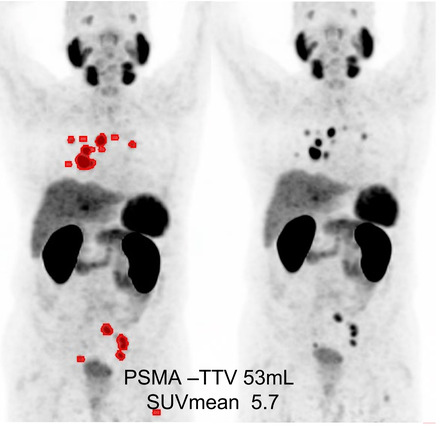

Figure 1 - PSMA PET scan with low volume nodal and bone metastases.

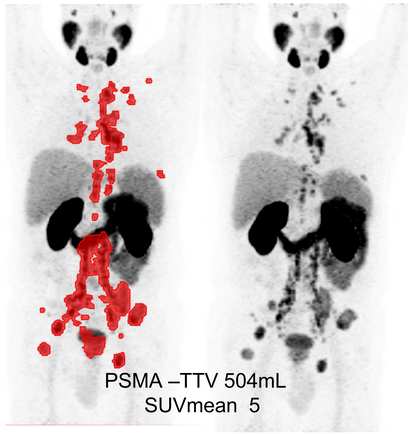

Figure 2 - PSMA-PET with high volume nodal and bone metastases.

PSMA PET/CT total tumor volume (TTV) is the total volume (mL) of all quantitatively identified tumor deposits combined using a minimum SUVmax 3 and 0.2mL volume to identify each tumor deposit. SUVmean is the mean voxel intensity of all tumor deposits included in the TTV.

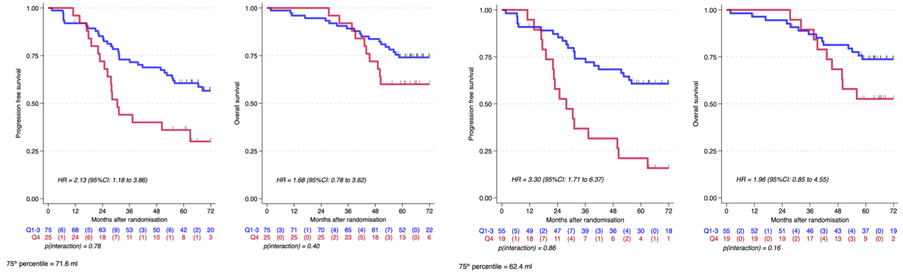

Figure 3 – TTV Q4 vs Q1-3 in PSMA PET/CT for progression free and overall survival in complete cohort.

Figure 4 – TTV Q4 vs Q1-3 in CHAARTED low volume cohort for progression free and overall survival

6. Conclusion

PSMA-TTV is associated with PFS in mHSPC in this ENZAMET sub-cohort with the highest volume quartile showing significantly shorter PFS, including within the CHAARTED criteria low volume cohort. Further validation of PSMA-TTV as a prognostic biomarker with potential to identify patients for intensification is warranted in larger mHSPC cohorts.

7. Contact

For further details visit:

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