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1675P: Potential effect of adipose tissue distribution on clinical outcomes in advanced non-small-cell lung cancer (NSCLC) patients (pts) receiving first-line Pembrolizumab (PEMBRO)

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Background

- Understanding the key mechanisms behind the immunotherapy's response heterogeneity is one of the major unmet need and intense research field in immuno-oncology[1].
- Specific body composition (BC) phenotypes, such as loss of muscle mass and fat tissue distribution, may reflect aspects of patients' immunology and thereby their ability to respond to immunotherapies[2].
- Computed tomography (CT) images routinely acquired from health records of NSCLC pts may be used to quantify specific lean and adipose tissues, and to evaluate individual pts in a clinical and therapeutic decision-making setting[3].

- **In this light, the main objective of this study was to evaluate the prognostic value of BC parameters evaluated by CT in NSCLC pts receiving first-line PEMBRO.**
- **Secondary objective was to explore the correlation of BC with ECOG PS and comorbidities.**

Methods

- A retrospective analysis of consecutive advanced NSCLC pts treated with PEMBRO as first-line therapy at Medical Oncology of University Hospital and Trust of Verona (Italy) and at Medical Oncology, Università Cattolica del Sacro Cuore, Fondazione Policlinico Universitario A. Gemellli, I.R.C.C.S., Roma, (Italy) between August 2017 and August 2020 was performed.
- The area (cm^2) and density (Hounsfield Units [HU]) of skeletal muscle area [SMA], and adipose tissue (subcutaneous [SAT], visceral [VAT], and intermuscular [IMAT]) were measured on pre-treatment CT scans at the level of the third lumbar vertebra.
- Clinical and tumour parameters were also retrieved.
- Descriptive statistic was adopted.
- Data were correlated to progression-free/overall survival (PFS/OS) using a Cox and logistic regression model.
- Log-Rank analysis was used for Kaplan-Meier curves comparison.

Results

Patients' population

- Overall data from 77 pts (52 males [67.5%] and 25 females [32.5%]) were gathered [Table 1].
  - Median age was 68 years (yrs) [range 36-85 yrs].
- Median follow-up was 11 months (mo.) [range 1-42 mo.].
- Comorbidities were reported in 49 (63.6%) pts.

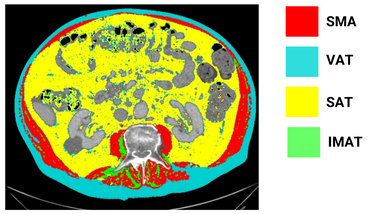
Table 1. Clinical- pathological and treatment characteristics of pts.

Characteristics	Subcategories	N° of Pts (%)
ECOG performance status	0	28 (36.4)
	1	28 (36.4)
	2	19 (24.7)
	3	2 (2.6)
Smoker	Active	27 (35.1)
	Former	40 (51.9)
	Never	4 (5.2)
	Not evaluated	6 (7.8)
Histology	Adenocarcinoma	59 (76.6)
	Squamous	14 (18.2)
	Carcinoma	4 (4.2)
Stage	I	2 (2.6)
	II	3 (3.9)
	III	5 (6.5)
	IV	67 (87.0)
Comorbidities	Yes	49 (63.6)
	No	28 (36.4)
Radiotherapy	Yes	8 (10.4)
	No	69 (89.6)
Surgery	Yes	8 (10.4)
	No	69 (89.6)
Best Response to First Line PEMBRO	Complete Response	5 (6.4)
	Partial response	19 (24.7)
	Stable Disease	14 (18.2)
	Progressive Disease	38 (49.4)
	Not evaluated	1 (1.3)

Table 2. Baseline BC distribution of pts.

Variable	Median (IQR)
SMA (cm^2)	125.7 (51.9; 227.7)
SAT (cm^2)	136.6 (16.1; 361.1)
VAT (cm^2)	109.3 (2.8; 344.4)
IMAT (cm^2)	10.5 (3.6; 42.2)

Figure 1. Example of BC analysis for measurement of tissues areas.



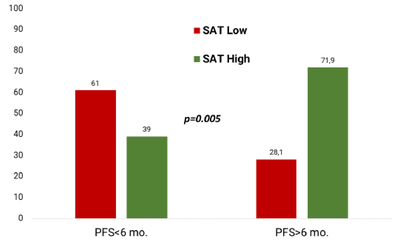
BC and Survival Outcome

- Median PFS and OS were 3 (95% CI, 2-4) and 10 (95% CI, 8-13) months, respectively.
- At univariate analysis for 6-mo. PFS, SAT was a significant prognostic factor (Table 3).
- A changepoint method based on the log-rank test was applied to SAT values in order to estimate the most appropriate cut-off able to split patients into groups with different PFS probabilities: the optimal cut-off was 143 cm^2.
- Particularly, pts with pre-treatment higher SAT had significantly longer PFS compared to patients with lower SAT (median 8 vs. 3 months, *p = 0.05*) (Figure 2).

Table 3. BC and 6-mo. PFS.

Variable	HR	95% CI	p-value
SMA (cm^2)	0.99	0.97-1.0	*0.102*
SAT (cm^2)	**1.01**	**1.0-1.02**	***0.45***
VAT (cm^2)	1.0	0.99-1.01	*0.402*
IMAT (cm^2)	0.98	0.99-1.01	*0.779*

Figure 2. PFS distribution according to SAT.



- Although BC parameters were not associated with OS, this was numerically higher in those pts with higher SAT (median 18 vs. 12 months, *p = 0.11*).

Correlation of BC with PS and comorbidities

- All BC parameters were significantly correlated with ECOG PS and the presence of comorbidities.

Conclusion

- These preliminary results support the hypothesis that BC may impact on survival of advanced NSCLC pts treated with PEMBRO, suggesting a potential interaction between immune system and BC.
- Further analyses are ongoing in this pts' cohort in order to monitor BC changes during treatment, as well as to explore the biological rational supporting the emerging close relationship between immune system and nutritional parameters.

References

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All authors declare no conflict of interests related to this study.

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