**PROGNOSTIC VALUE OF T CELL IMMUNOSCORE ESTIMATED FROM TRANSCRIPTOMIC DATA IN PATIENTS WITH ADVANCED MALIGNANCIES TREATED WITH IMMUNE CHECKPOINT INHIBITORS**

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**Background** Evidence supports the association between tumor-infiltrating lymphocytes with disease prognosis and response to immunotherapy. Here, we evaluated the prognostic value of an immunoscore reflecting CD3+ and CD8+ T cell density in patients with advanced malignancies treated with immune checkpoint inhibitors (ICIs).

**Methods** We utilized real-world clinical and transcriptomic data collected under the Total Cancer Care Protocol (NCT03977402) and Avatar® project within the Oncology Research Information Exchange Network (ORIEN) of 18 cancer centers to which all included subjects provided a written informed consent at their participating institutions. The immunoscore for each patient was calculated based on the estimated densities of tumor CD3+ and CD8+ T cells (Galon, 2020) utilizing CIBERSORTx and the LM22 gene signature matrix. Overall survival (OS) predictions were assessed using Harrell’s concordance index (C-index). Kaplan-Meier (KM) curves and the log-rank test were used to assess the immunoscore ability to stratify risk groups.

**Results** Patients (n=522) with 4 cancer types including melanoma (n=125), renal cell carcinoma (n=149), non-small cell lung cancer (n=128) and head and neck cancer (n=120) treated with 6 immune checkpoint inhibitor (ICI) regimens were included in this analysis. ICI regimens were nivolumab (n=219), pembrolizumab (n=202), ipilimumab+nivolumab (n=69), ipilimumab (n=30), avelumab (n=1) and cemiplimab (n=1). Table 1 summarizes the overall C-index and associated 95% CIs and log-rank p-values for the entire cohort resulting from estimated immunocore categorizations. KM analyses of the entire cohort are displayed in figure 1. We compared the performance of the immunoscore as a prognostic biomarker in the 4 cancer types, with significant results seen only in the melanoma and head and neck cancer cohorts (table 2, figure 2).

**Conclusions** The CD3+, CD8+ T Cell immunocore estimated from transcriptomic data represents a prognostic biomarker for estimating overall survival in patients with metastatic melanoma and head and neck cancer treated with ICIs in a real-world setting and can be used as a reference in prognostic biomarker development. Integration with other biomarker candidates that may guide the choice of ICI regimen (anti-PD1 monotherapy versus combinations) is underway.

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**Trial Registration** NCT03977402

**Ethics Approval** We utilized real-world clinical and transcriptomic data collected under the Total Cancer Care Protocol (NCT03977402) and Avatar® project within the Oncology Research Information Exchange Network (ORIEN) of 18 cancer centers to which all included subjects provided an IRB-approved written informed consent at their participating institutions.