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POSTER ABSTRACTS

627.AGGRESSIVE LYMPHOMAS: CLINICAL AND EPIDEMIOLOGICAL

Improved Risk Prediction in DLBCL By Combining Clinical and PET Features with Interim PET Assessment

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Background: Accurate detection of patients at high risk of treatment failure following frontline immunochemotherapy in diffuse large B-cell lymphoma (DLBCL) is of paramount importance as these patients might benefit from early treatment escalation. Recently, we introduced the IMPI prognostic model based on metabolic tumor volume (MTV), age and stage that outperformed the international prognostic index (IPI). However, radiomic features such as $Dmax_{bulk}$ and SUV_{peak} as well as an early treatment response at interim PET (i-PET) as a measure of chemosensitivity using ΔSUVmax may have additional predictive value. We tested different models for risk prediction aiming at a dynamic risk tool in the era of evolving radiomic features in functional imaging.
Methods: All patients within the PETRA database with newly diagnosed DLBCL, who were treated with R-CHOP and had available clinical data, baseline PET and i-PET scans were included.
The optimal transformation of $Dmax_{bulk}$, SUV_{peak} and ΔSUV_{max} was determined by choosing the best fitting Cox regression model with 3-year PFS as outcome, with highest R2 and lowest Akaike Information Criterion (AIC), while the cross-validated c-index was obtained as a measure for discrimination.
Subsequently, risk models were developed using clinical, baseline PET and i-PET data. The best risk model was compared to the IMPI model and our subsequent ClinicalPET model, also incorporating radiomic features (MTV, IPI, age, SUV_{peak} and $D_{maxbulk}$) by determination of risk re-classification rates and by generating kaplan-meier (KM)-curves based on 60-30-10 PFS risk groups.
Results: 1014 patients were included in the analyses. Adding i-PET reponse (ΔSUV_{max}) to the IMPI model markedly improved outcome prediction (AIC 3177.44, c-index 0.72) and was superior to IMPI model alone (AIC 3247.09, c-index 0.68). By adding $D_{maxbulk}$ outcome prediction was further improved (AIC 3143.23, c-index 0.74), while SUV_{peak} did not show significant impact on outcome (p=0.07). Compared to the IMPI and the ClinicalPET model, the new model combining baseline features (MTV,

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age and $D_{maxbulk}$) with i-PET reponse (ΔSUV_{max}) led to a sharper segregation of KM-curves with an improved rate of correct progression risk classification (22%; 95% confidence interval 12.1-31.1%).
Conclusions: Adding i-PET reponse to baseline clinical and PET parameters optimizes risk classification in DLBCL enabling individualized risk assessment in early phase of frontline treatment and outperforms our previous IMPI model and ClinicalPET models.

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