features that adress inter-lesional heterogeneity in distance, metabolic volume and SUV. Therefore, this model is suitable for application in clinical trials and could guide risk-stratified treatment in r/r cHL.

EA - previously submitted to EHA 2021.

The research was funded by: SHOW foundation (Amsterdam UMC donation fund to support hematology/oncology scientific research)

Keywords: Diagnostic and Prognostic Biomarkers, PET-CT, Hodgkin lymphoma

No conflicts of interests pertinent to the abstract.

022 | DEVELOPMENT AND VALIDATION OF A PET RADIOMICS PROGNOSTIC MODEL FOR DIFFUSE LARGE B CELL LYMPHOMA

L. Ceriani[1], L. Milan[1], L. Cascione[2], G. Gritti[3], F. Dalmasso[4], F. Esposito[5], Säm. Schär[6], A. Bruno[7], S. Dirnhofer[8], L. Giovanella[1], S. Hayoz[6], C. Mamot[9], A. Rambaldi[3], S. Chauvie[4], E. Zucca[5]

[1]*Ente Ospedaliero Cantonale, Clinic of Nuclear Medicine and PET/CT Center, Lugano, Switzerland*, [2]*Università della Svizzera Italiana, Institute of Oncology Research, Faculty of Biomedical Sciences, Bellinzona, Switzerland*, [3]*Azienda Ospedaliera Papa Giovanni XXIII, Hematology Unit, Bergamo, Italy*, [4]*Santa Croce e Carle Hospital, Medical Physics Unit, Cuneo, Italy*, [5]*Ente Ospedaliero Cantonale, Institute of Southern Switzerland, Clinic of Medical Oncology, Bellinzona, Switzerland*, [6]*Swiss Group for Clinical Cancer Research (SAKK), Swiss Group for Clinical Cancer Research (SAKK) Coordinating Center, Bern, Switzerland*, [7]*Azienda Ospedaliera Papa Giovanni XXIII, Department of Nuclear Medicine, Bergamo, Italy*, [8]*University Hospital Basel, Institute of Medical Genetics and Pathology, Basel, Switzerland*, [9]*Cantonal Hospital Aarau, Division of Oncology, Aarau, Switzerland*

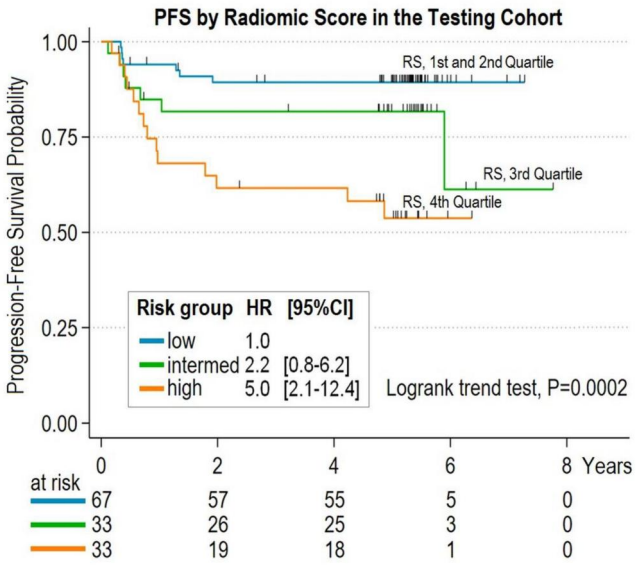
Introduction: Functional parameters derived from positron emission tomography/computed tomography (PET/CT) seem promising biomarkers in various lymphoma subtypes. The present study investigated the prognostic value of PET/CT radiomics features in diffuse large B-cell lymphoma (DLBCL) patients uniformly treated with standard immunochemotherapy (R-CHOP regimen, either every 14 or 21 days).

Methods: Using the PyRadiomics Python package, 108 radiomics features were extracted from the baseline PET/CT scans of a testing set of 133 patients enrolled in the SAKK 38/07 prospective clinical trial of the Swiss Group for Clinical Cancer Research (SAKK). We used Spearman correlation test to select uncorrelated features. The international prognostic indexes, the main clinical parameters and the standard PET metrics were included, together with 52 radiomics features, in a least absolute shrinkage and selection operator (LASSO) Cox regression to assess their impact on cause-specific (CSS) and progression-free (PFS) survival. A linear combination of the resulting parameters generated a prognostic radiomics score (RS) whose area under the curve (AUC) was calculated by receiver operating characteristic (ROC) analysis. The RS prognostic efficacy was validated in an independent set of 107 DLBCL patients.

Results: LASSO Cox regression identified four radiomics features (GLCM_SumOfSquares*, Shape_Maximum3Diameter/BSA*, GLSZM_GrayLevelNonUniformityNormalized*, GLDM_GrayLevelVariance*) predicting PFS in the SAKK 38/07 cohort. The derived RS showed a significant capability to foresee PFS in both testing (AUC, 0.709; 95%CI, 0.623-0.784; $P < 0.001$) and validation (AUC, 0.706; 95% CI, 0.610-0.790; $P < 0.001$) sets. RS maintained its prognostic value (HR, 2.1; 95%CI, 1.4-3.2) after controlling for MTV in multivariable Cox regression and was significantly associated also with CSS in testing (AUC, 0.721; 95%CI, 0.636-0.795; $P < 0.001$) and validation (AUC, 0.763; 95%CI, 0.671-0.840; $P < 0.0001$) sets. Patient stratification according to RS quartiles identified subgroups of patients with a progressively shorter PFS. Patients in the first and second quartiles had a significantly better survival than those with RS values above the median. A prognostic index could be built in both cohorts separating 3 groups of patients with significantly different PFS and CSS: low risk (1st and 2nd quartile) intermediate risk (3rd quartile) and high-risk group (4th quartile). This index showed better predictive accuracy in comparison with clinical international prognostic indices.

Conclusions: PET-derived radiomics may improve the prediction of outcome in DLBCL patients treated with conventional immunochemotherapy.

*For the feature description: https://pyradiomics.readthedocs.io/en/latest/features.html



Keywords: Diagnostic and Prognostic Biomarkers, PET-CT, Aggressive B-cell non-Hodgkin lymphoma

No conflicts of interests pertinent to the abstract.