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Value of Positron Emission Tomography Parameters for the Prognosis of Small-Cell Lung Carcinoma

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Objectives: The aim of this study was to retrospectively evaluate the prognostic value of pre-treatment FDG PET/CT metrics, including SUVmax of the primary tumor (PT), lymph nodes (LN) and metastatic lesions in small cell lung cancer (SCLC) patients who were staged with TNM staging system (8th edition).

Methods: A total of 344 patients (292 male and 52 female) with biopsy- proven SCLC patients undergoing chemotherapy (+/- radiotherapy) between 2010 and 2015 was included in the study. One hundred fifty-three of cases were TNM stage I-III (defined as non-metastatic disease; non-MD), 191 of cases were TNM stage IV (defined as metastatic disease; MD). Each patient underwent a pre-treatment whole-body FDG PET/CT after injecting of 18F-FDG (0.10 mCi/kg) intravenously. Kaplan-Meier analysis was performed to assess the survival. PET metrics were dichotomized in according to median splits for comparison. Univariate and multivariate analysis were performed to determine for the effect of pre-treatment SUVmax and other clinical variables on outcomes.

Results: Median overall survival (OS) and progression free survival (PFS) for patients with non-MD were 16.50 and 11.00 months, respectively. Median OS and PFS for patients with MD were 10.00 and 7.00 months, respectively. SUVmax of the PT, LNs or metastatic focus were not significantly associated with OS and PFS on univariate analysis. On multivariate analysis, SUVmax-PT with cut-off value of 11.60 was found to be an independent prognostic factor for OS in patients with non-MD (Hazard Ratio [HR], 1.88; p=0.012). SUVmax were not significantly associated with OS and PFS in patients with MD.

Conclusion: Pre-treatment SUVmax-PT are prognostic factor of OS in non-metastatic SCLC patients undergoing treatment. SUVmax have no prognostic value for survival in metastatic SCLC patients.

Keywords: SUV max, prognosis, small cell lung cancer, PET, survival