Purpose: The aim of this study was to analyze the affect factors with radiation induced lung injury of NSCLC treated by 3DCRT in order to supply reference criteria for optimize the treatment planning, further to improve the local control rate and the quality of life of NSCLC patients.

Methods: From August 2000 to December 2004, 107 NSCLC patients received 3DCRT were retrospectively enrolled in this study. All of patients received the prescription doses ranged from 60-68Gy with a median dose of 66Gy. Dosimetric parameters of dose-volume histograms from 3DCRT plans was recorded. The lung injury were assessed for each patient during the treatment and follow-up within 3 months after treatment completion. Acute radiation induced pneumonitis were graded by one radiation oncologist according to the RTOG/EORTC criteria. The correlation between dosimetric parameters with lung injury was evaluated by univariate and multivariate analysis using Logistic Regression Model of SPSS11.0 software.

Results: In the 107 patients of NSCLC, the rate of irradiated induced lung injury was 62.6% and the rate of ≥2 grade radiation induced pneumonitis was 38.3%. Twenty-three cases were classified in grade 2, fourteen cases in grade 3, and four cases in grade 4. Univariate analysis showed chronic obstructive pulmonary disease (COPD), number of beams field, lung mean dose, lung V5-V40 were important parameters on radiation induced lung injury. The rate of ≥2 grade lung injury was 56.3% (18/32) in patients accompany COPD, compared with 30.7% (23/75) of those without COPD. In the same way, the rate of ≥2 grade lung injury was 61.9% (26/42) in patients of lung mean dose ≥20Gy, which higher than 19.4% (12/62) of lung mean dose <20Gy. Further more, lung mean dose, lung V20 and COPD were likely to be the independent factors of radiation induced lung injury by Logistic Regression Model.

Conclusions: Lung mean dose, lung V20 and COPD were the independent affect factors on irradiated induced lung injury.

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