

Purpose:To understand the correlation between radiation induced pneumonitis (RIP) and esophagitis (RIE) with dosimetric parameters for patients treated using 3-D conformal radiation therapy (3DCRT) for non-small cell lung cancers (NSCLC).

Methods:Dosimetric parameters of dose-volume histograms from 3DCRT plans for 104 NSCLC patients treated between 2000 to 2004 from our hospital were retrospectively analyzed. The prescription doses ranged from 60-78Gy with a median dose of 66Gy. The RIP and RIE were assessed for each patient during the treatment and follow-up within 3 months after treatment completion. The correlation between dosimetric parameters with RIP and RIE were evaluated by univariate and multivariate analysis using Logistic Regression Model of SPSS11.0 software. The predictive ability of parameters was assessed with receiver operating characteristic (ROC)curves. The area under the curve (AUC) was used to filter cut-off values for predictive RIP and RIE.

Results: The rate of RIP \geq 2 grade was 38.3% for patients. Univariate analysis showed that the lung mean dose and volumes receiving doses from 5 to 40Gy (V5-V40)were important factors for predicting RIP. Multivariable analysis indicated that lung V35 was likely to be an independent factor. The optimal cut-off value for lungV35 was 20.75%, corresponding to sensitivity of 66.10% and specificity of 81.00% in ROC curve. The rate of RIE was 46.2%. Multivariate analysis showed that both GTV and PTV of NSCLC, and esophagus V60 were the independent parameters for predicting RIE. The optimal cut-off value for esophagus V60 was 12.50%, corresponding to sensitivity of 81.30% and specificity of 69.60% in ROC curve. It was found that there was significantly difference between AUC of ROC curve for esophagus V60 and those for GTV's and PTV's of NSCLC (P<0.05).

Conclusions:lung V35 and esophagus V60 were likely to be the independent factors predicting of RIP and RIE, respectively.

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