

**Predictors of early hospice or death in patients with inoperable lung cancer treated with curative intent.**

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**Background:** Treatment for inoperable stage II-III non-small cell lung cancer (NSCLC) involves aggressive chemo-radiotherapy (CRT). While outcomes have improved with immunotherapy, some patients transition to hospice or die early in their treatment course. To help identify these patients, we developed a predictive model for early poor outcomes in NSCLC patients treated with curative intent. **Methods:** In a statewide consortium involving 27 sites, information was collected prospectively on stage II-III NSCLC patients who received curative CRT from April 2012 to November 2019. We defined an early poor outcome as termination of treatment due to hospice enrollment or death within 5 months of initiating radiation therapy. Potential predictors included clinical characteristics and patient reported outcomes (PROs) from validated questionnaires. Logistic regression models were used to assess potential predictors and build predictive models. Multiple imputation was used to handle missing data. We used Lasso regularized logistic regression to build a predictive model with multiple predictor variables. **Results:** Of the total of 2267 included patients, 128 patients discontinued treatment early due to hospice enrollment or death. The mean age of the 128 patients was 71 years old (range 48-91) and 59% received concurrent chemotherapy. Significant uni-variable predictors of early hospice or death were advanced age, worse ECOG performance status, high PTV volume, short distance to normal tissue critical structures, high mean heart dose, uninsured status, lower scores on the Functional and Physical Well-Being scale and the Lung Cancer Symptoms sub-scale of the FACT-L quality of life instrument, as well as higher levels of patient-reported lack of energy, cough, and shortness of breath. The best predictive model included age, ECOG performance status, PTV volume, mean heart dose, patient insurance status, and patient-reported lack of energy and cough. The pooled estimate of area under the curve (AUC) for this multivariable model was 0.71, with a negative predictive value of 95%, specificity of 97%, positive predictive value of 23%, and sensitivity of 16% at a predicted risk threshold of 20%. **Conclusions:** Our models identified a combination of clinical variables and PROs that may help identify individuals with inoperable NSCLC undergoing curative intent chemo-radiotherapy who are at a high risk of early hospice enrollment or death. These preliminary results are encouraging and warrant further evaluation in a larger cohort of patients. Research Sponsor: Blue Cross Blue Shield Blue Care Network.