

Effects of treatment delays on lung cancer survival.

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Background: Previous studies have established a link between treatment initiation delays and reduced overall survival in individuals diagnosed with lung cancer. These delays are often influenced by diagnostic complexities, logistical hurdles, and patient-related factors. However, the association between treatment delays and survival outcomes has yet to be extensively investigated using data from a large national cohort. This study aims to fill this research gap and provide unique insights into the relationship between treatment delays and lung cancer survival by utilizing data from a substantial national cohort. **Methods:** The study population consisted of 3,723 lung cancer patients participating in the NCI PLCO Cancer Screening Trial. Cox Proportional Hazards (PH) Regression analyses examined the time between cancer diagnosis and treatment initiation using several measures including intervals from tumor doubling/stage progression time models by Spratt et al. (1964) and Detterbeck et al. (2008). Analyses controlled for patient and clinical characteristics including age, sex, race/ethnicity, smoking status, histopathologic type, cancer stage, and treatment modality. Data analysis was conducted using Microsoft Excel, STATA, and IBM SPSS software. **Results:** PH Regression analyses demonstrated a clear association between longer time intervals from diagnosis to treatment initiation and increased risk of mortality. Patients with time intervals exceeding 20 days exhibited a hazard ratio (HR) for mortality of 1.21 ($p < 0.001$, 95% confidence interval [CI] 1.1158–1.3176). The Spratt tumor progression model, considering intervals exceeding 88 days, revealed a HR of 1.22 ($p = 0.03$, 95% CI 1.0146–1.4885). On the other hand, the Detterbeck model, which considered intervals exceeding 118 days, did not show a statistically significant association with increased mortality risk. Furthermore, PH analysis identified cigarette smoking status, marital status, and tumor grade as significant predictors of mortality risk. **Conclusions:** Data from a large national cohort study indicate that delays in lung cancer treatment initiation have detrimental impacts on survival. Treatment initiation shortly after diagnosis had the most significant differential impact on mortality risk. Timely initiation of treatment is of utmost importance and should be prioritized in lung cancer care. By addressing factors contributing to treatment delays, it is likely possible to improve the survival rates of patients with lung cancer. Research Sponsor: U.S. National Institutes of Health.