10.7861/clinmed.22-4-s38

Understanding prognosis and survival outcomes in patients with early-stage non-small-cell lung cancer

Authors: Maria Torrente,[A] Pedro A Sousa,[B] Fabio Franco,[A] Gracinda Guerreiro,[B] Alexandre Sousa,[B] Consuelo Parejo,[A] Joao Pimentao[B] and Mariano Provencio[A]

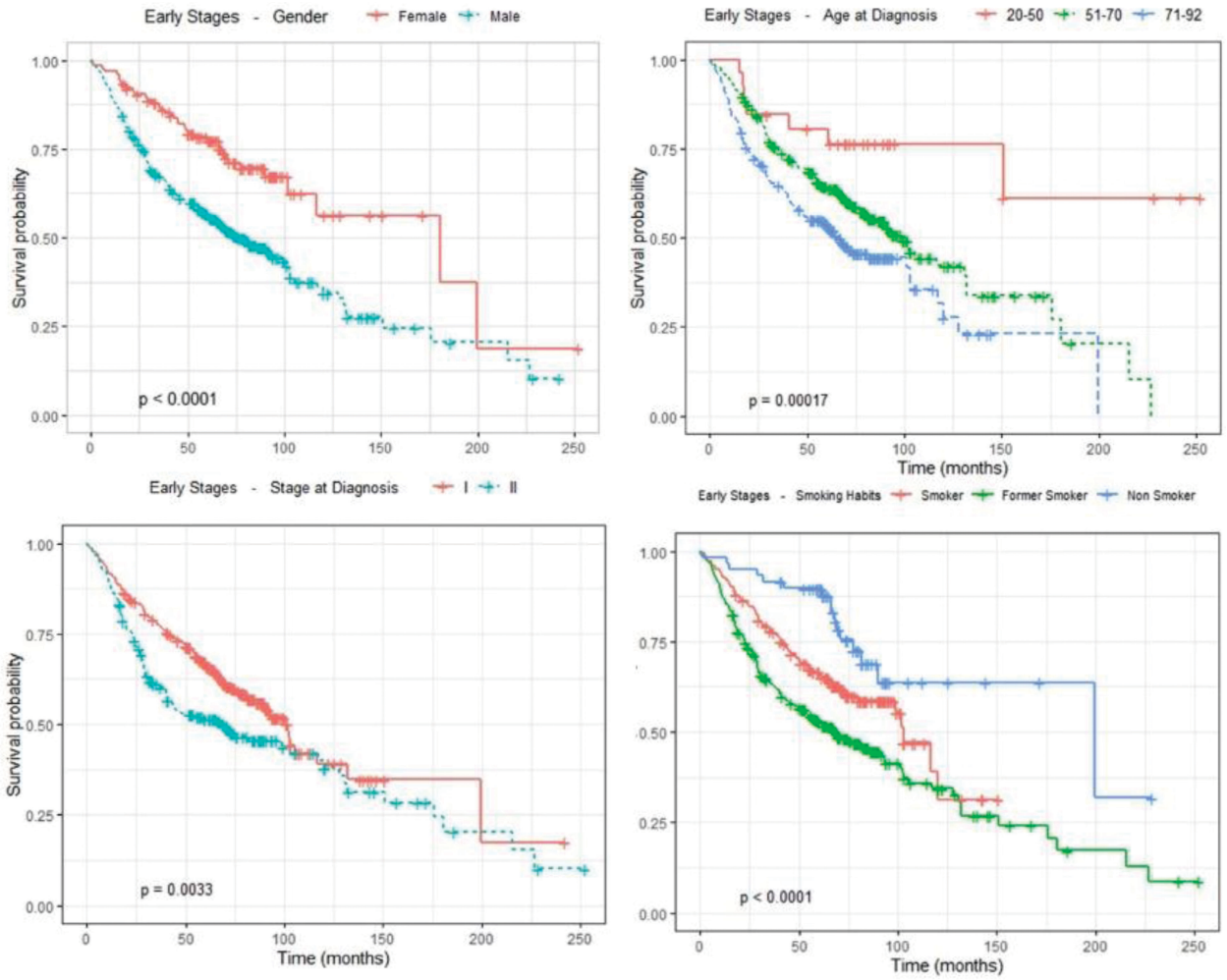

Fig 1. Survival analysis in the early stages according to gender, stage and age at diagnosis and smoking habit.

Introduction

Lung cancer represents a significant global health problem, accounting for more than 1.7 million deaths worldwide in 2021.[1]

Despite advances in cancer treatment over the last decade, the 5-year survival rate is still around 50% for surgically resected non-small-cell lung cancer (NSCLC). Even for stage I patients, 20% showed recurrence within 5 years.[2] Treatment modality, mostly dictated by stage and the patient's performance status (PS), directly determines disease survival. Adjuvant radiotherapy is no longer recommended after surgery and several recent large trials

Authors: [A]Hospital Universitario Puerta de Hierro Majadahonda, Majadahonda, Spain; [B]Universidade Nova de Lisboa, Lisbon, Portugal

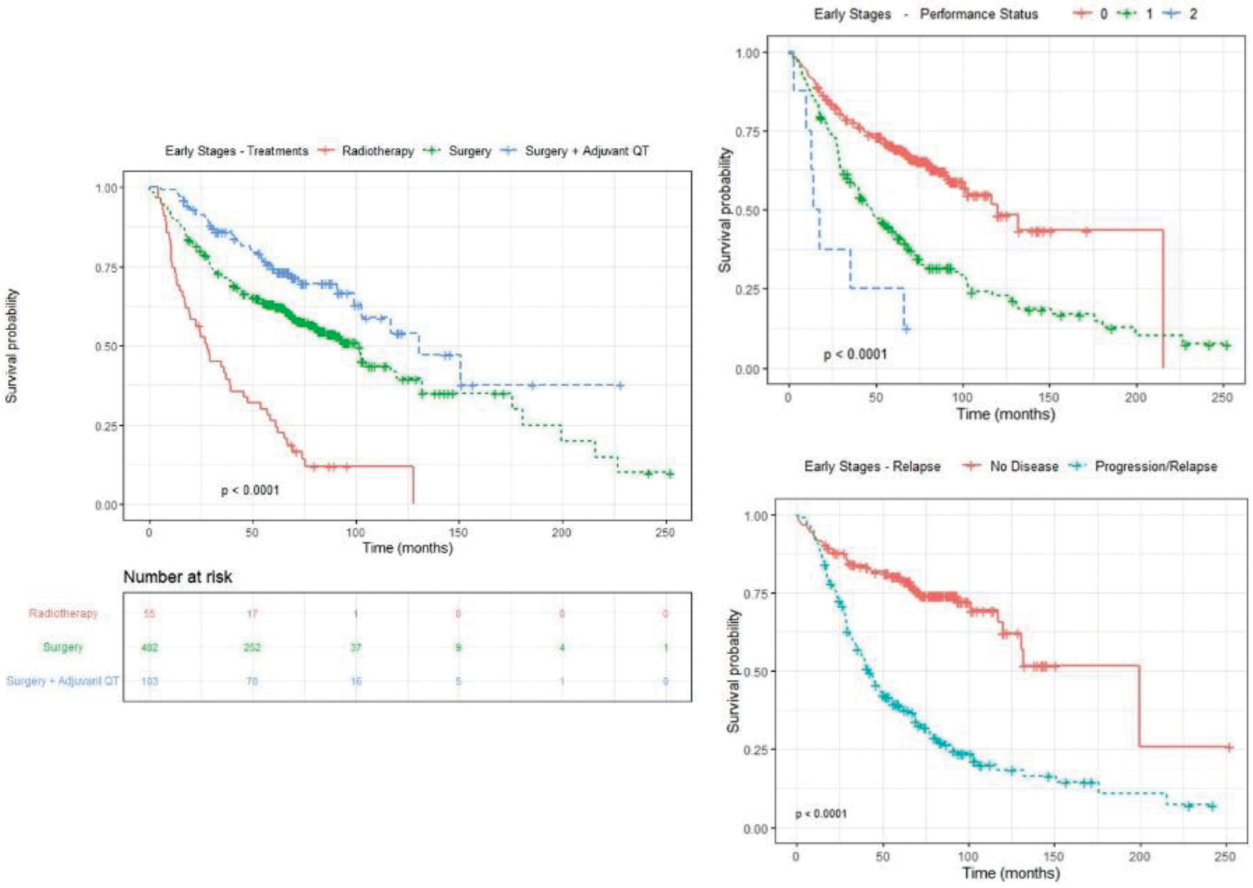

Fig 2. Survival analysis in the early stages according to treatment, performance status and relapse.

have confirmed the benefit in overall survival (OS) with adjuvant chemotherapy.[3–6] Thus, the identification of patients with poor prognoses after surgery is of considerable clinical relevance.

We report the results of a study population survival analysis from patients diagnosed with early-stage NSCLC at Puerta de Hierro-Majadahonda University Hospital, a tertiary hospital in Madrid, Spain. Our objective was to determine their clinicopathological characteristics at diagnosis, analyse survival and develop a stratification model to identify poor prognosis factors.

Methods

A total of 560 patients with histological confirmation of NSCLC in early stages (I–II) were included. Statistical analysis was performed using R Software, version 4.0.5. Univariate survival analysis was performed using Kaplan–Meier curves and survival functions were compared using a log-rank test to check for differences. Statistical significance was set at $p<0.05$. To investigate the contribution of each characteristic in the survival time, Cox multivariate regression model was adjusted.

Results and discussion

Overall, there was a significantly greater number of men (77.5%) compared with women (22.5%). The median age at diagnosis was 60.6 years. Regarding smoking habits, 56% of the diagnosed patients were former smokers and 31% current smokers, with only 10.5% of never smokers; and 35% patients relapsed. The univariate analysis identified statistically significant differences ($p<0.001$) according to gender with greater survival in women, age with greater survival to youngest and smoking habits with greater survival in non-smokers (Fig 1). As for treatment, survival is strongly improved by surgery and surgery with adjuvant chemotherapy compared with radiotherapy. PS also stands as a statistically significant factor that impacts prognosis (Fig 2) along with relapse. Multivariable analysis shows that age, surgery, adjuvant chemotherapy, PS and relapse are the most significant variables, while gender, stage, comorbidities, smoking habit and radiotherapy are not statistically significant ($p>0.05$). Accordingly, we identified and integrated significant prognostic factors for survival in the patient cohort to build a model that could stratify patients by risk.

Conclusion

In this cohort study, patients predicted to be at a higher risk by the model were men, over 70 years old, former smokers, received radiotherapy, had a PS of 2 and had relapsed. The identified features for the low profile were being a woman, 20–50 years old, non-smoker, who underwent surgery and adjuvant chemotherapy, had a PS of 0, and no relapse. High-risk clinicopathologic features should be considered simultaneously when evaluating patients with early-stage NSCLC for improving prognosis. ■

Funding statement

This work was supported by the European Union Horizon 2020 Research and Innovation Program, under grant agreement N° 875160 (Project CLARIFY).

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