Survival Analysis of Metastatic NSCLC Patients Treated with Pembrolizumab

Real-World Overview of First-Line Pembrolizumab Monotherapy in Metastatic NSCLC (2019–2024)

Background: NSCLC accounts for approximately 85% of all lung cancer cases and is often diagnosed at an advanced or metastatic stage, where treatment options are limited. Pembrolizumab, an anti-PD-1 immune checkpoint inhibitor, has become a standard first-line monotherapy for patients with NSCLC, showing improved survival in clinical trials. This study investigates its real-world use using multi-centric data from the INAH platform, which integrates clinical data from CHC Montlégia, CHU Liège, and GHDC into OMOP CDM-compliant warehouses.

About INAH

INAH is a Belgian federated health data network. It's a non-profit organization founded in 2024 by two hospital federations (Santhea and Unessa) and the association of French-speaking general practitioners (CMG). Its main objective is to facilitate the secondary use of health data to accelerate scientific research.

Method

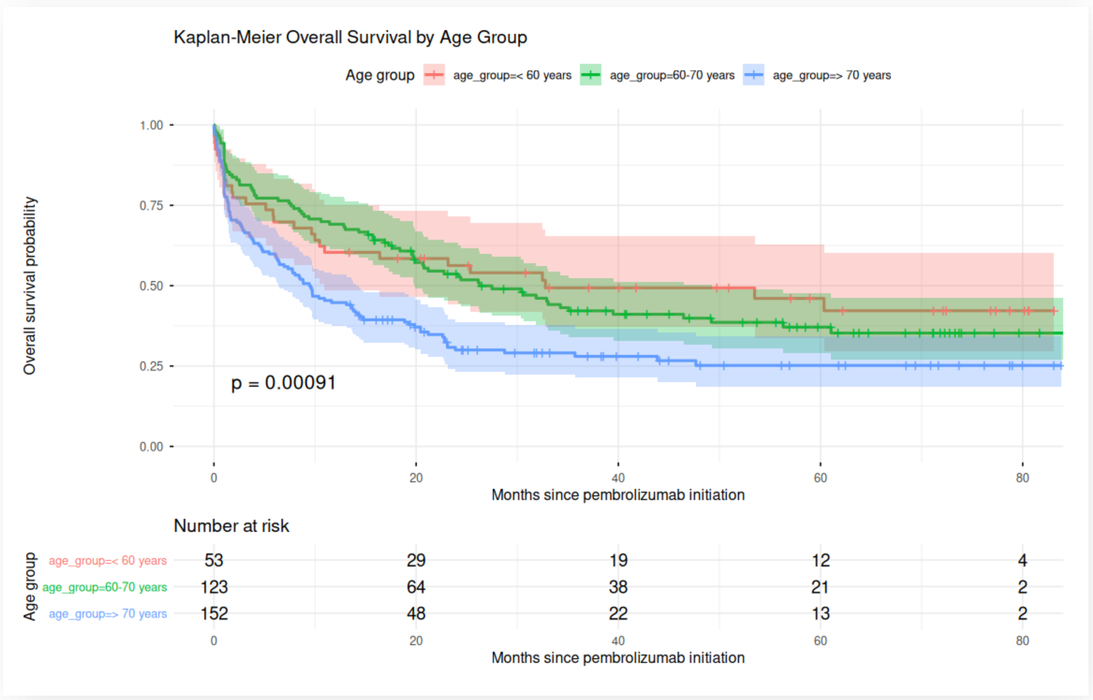
An OMOP-based query was developed to emulate the KEYNOTE-042 trial criteria and applied across three INAH data sources, identifying adult patients with metastatic non-small-cell lung cancer (NSCLC) treated with Pembrolizumab monotherapy between 2019 and 2024. A comprehensive set of covariates—including demographics, comorbidities, and concurrent medication use—was analyzed. Survival analysis was conducted alongside data quality assessments, including the strong correlation observed between treatment duration and number of administrations.

Results

In the overall population, 2-year survival rate was 43.2% and 3-year survival rate was 36.6%.

When stratified by age group, patients aged <60 years had a 2-year survival rate of 56.3% (95% CI: 44.3–71.5) and a 3-year survival rate of 49.3% (95% CI: 37.2–65.4). Patients aged 60–70 years had a 2-year survival rate of 53.7% (95% CI: 45.4–63.4) and a 3-year survival rate of 42.2% (95% CI: 34.0–52.3). Patients aged >70 years had the lowest survival rate, with 2-year survival rate of 30.0% (95% CI: 23.3–38.6) and 3-year survival rate of 28.0% (95% CI: 21.4–36.6).

Survival rate varied significantly across age groups (log-rank test, χ^2 = 14, df = 2, p = 0.0009), with poorer outcomes observed in patients older than 70 years.



Conclusion : In this real-world cohort of patients, overall survival was significantly associated with age but not with smoking status history. Older patients (>70 years) had markedly poorer survival rate compared to younger patients, while those under 70 years, particularly <60 years, showed more favorable outcomes. These findings are consistent with existing literature and may reflect differences in comorbidities, treatment tolerance, or disease biology. In contrast, no significant association was observed between smoking history and overall survival, with similar survival probabilities between ever smokers and patients with not known smoking history.

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