1396P - HER2 testing patterns: characteristics of locally advanced or metastatic NSCLC patients by HER2 testing in France

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Introduction

- Across studies of NSCLC, HER2 *(ERBB2)* mutations have been identified in ~2–4% of cases;[1,2] however, testing practices are not homogeneous across geographic locations[3,4]
- HER2-directed therapies have shown promising results in patients with HER2m NSCLC[5–9]
- Real-world data on HER2 testing in patients with NSCLC are limited; such data will facilitate understanding of the biomarker testing patterns, and reveal the landscape of patients with NSCLC who may benefit from targeted treatment

Objectives

- These analyses of patients with locally advanced or metastatic (LAM) NSCLC aimed to describe:
  - Population characteristics
  - Frequency and pattern of HER2 testing
  - Details of HER2 testing and HER2 alterations
  - Treatment patterns
  - Clinical outcomes

Methods

Study design: Retrospective real-world observational study of patients diagnosed with LAM NSCLC in France.

Data source: The EpidemioStrategy and Medical Economics (ESME) Lung cancer (LC) Data Platform is a multicenter real-life database that integrates data from patients' electronic medical records, inpatient hospitalization records, and pharmacy records. Cases were entered into the ESME LC database according to specific patient inclusion criteria: female or male, ≥18 years old, treated for lung cancer in a participating medical center in France from January 2015.

Sample selection: All patients who received a histologically confirmed diagnosis of LAM NSCLC (Stage ≥IIIB) between 2015 and 2020, without any previous malignancy. *De-novo* or relapsed diagnoses were included. Data were extracted from the database in April 2022.

Analyses: Descriptive analyses explored the LAM NSCLC cohort overall and stratified by HER2 testing status and results.

Results

Population characteristics

- Of 35563 patients in the ESME LC database overall, 22561 patients with LAM NSCLC met the eligibility criteria
- Among the 22561 patients, 33.4% (n=7530) were tested for HER2 alterations
- The demographics and clinical characteristics of patients by HER2 testing status are described in **Table 1**
  - The HER2-tested cohort had a higher proportion of those ≤60 years old (36.6%) vs HER2-not tested (31.7%) at LAM NSCLC diagnosis
  - There was a higher proportion of patients with squamous cell NSCLC in the HER2 not tested cohort (30.3%) versus the HER2 tested cohort (4.7%)

Table 1. Demographics and clinical characteristics of patients with LAM NSCLC by HER2 test status*

	HER2 not tested (n=15031)	HER2 tested (n=7530)	HER2+ cohort (n=189)
Female, n (%)	4689 (31.2)	3016 (40.1)	113 (59.8)
Mean age at LAM diagnosis, years (SD)	65.4 (10.5)	64.1 (10.9)	64.6 (11.9)
Age ≤60, n (%)	4762 (31.7)	2756 (36.6)	69 (36.5)
ECOG PS 0/1 at LAM diagnosis, n (%)*	1726 (60.4)	953 (68.5)	22 (61.1)
Histology at initial diagnosis, n (%)			
Squamous	4551 (30.3)	356 (4.7)	5 (2.6)
Non-squamous	10480 (69.7)	7174 (95.3)	184 (97.4)
Adenocarcinoma	8747 (58.2)	6439 (85.5)	177 (93.7)
Stage at LAM diagnosis, n (%)			
IIIB, IIIC	3491 (23.2)	1191 (15.8)	18 (9.5)
IV, IVA, IVB	11540 (76.8)	6339 (84.2)	171 (90.5)
Setting at LAM diagnosis, n (%)			
De-novo	11123 (74.0)	6039 (80.2)	155 (82.0)
Relapse	3908 (26.0)	1491 (19.8)	34 (18.0)

*Based on the number of patients with ECOG PS records

Frequency and pattern of HER2 testing

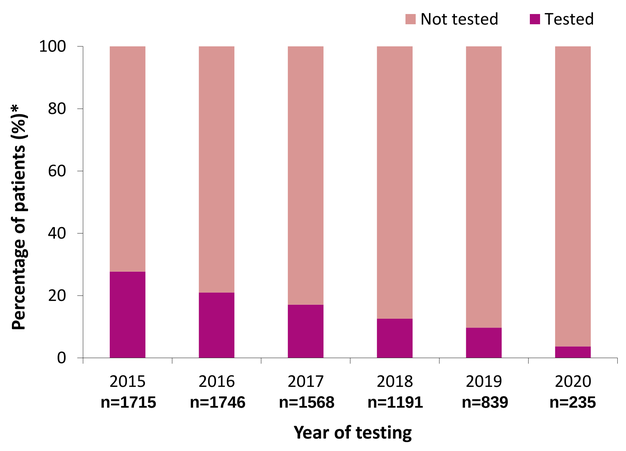
- Among patients whose samples underwent HER2 testing (n=7530), the majority of patients (n=6132, 81.4%) received their first HER2 test result after LAM NSCLC diagnosis, with a median time from diagnosis to test result of 28 days (IQR 19–50)
- The number of patients with LAM NSCLC whose tumors underwent HER2 testing decreased over the study period **(Figure 1)**

Results

Details of HER2 testing

- Primary tissue was the most common sample material for HER2 testing (n=5027, 71.5%), followed by metastatic tissue (n=1930, 27.4%) and blood (n=277, 3.9%)
- In the HER2 tested group (n=7530), 2.5% (n=189) of patients had HER2 alterations (HER2+), defined as mutation, amplification or overexpression; of these 95.0% were mutations within HER2 (HER2m)
- Additional biomarkers that were frequently tested for in the HER2+ cohort (n=189) were *ALK* translocation (n=142, 75.1%), *EGFR* mutation (n=161, 85.2%), and *ROS1* rearrangement and/or mutation (n=118, 62.4%)

Figure 1. Trend in HER2 testing between 2015 and 2020



*Calculated among patients alive (at least 30 days) in year N and diagnosed before December 31 of year N and never tested before year N

Treatment patterns

- Among patients whose samples underwent HER2 testing after LAM diagnosis (n=6132), 54.0% (n=3289) received their first HER2 test result prior to 1L treatment, with the median time to treatment start from the test result being 14 days (IQR 6–27)
- The majority of patients with a HER2+ result received only 1 LoT (n=60, 31.7%), with platinum-based chemotherapy being the most frequently received SACT (n=91, 53.5%) in this cohort
- In the HER2+ cohort, the percentage of patients who received HER2-targeted therapy in any LoT was low (range 2.9–20.9%), the highest percentage of patients received it as a 2L treatment (n=23, 20.9%)

Conclusions

- This study showed that the frequency of HER2 testing in patients with LAM NSCLC in France was low, and decreased over time
- This modification of practices may be partly associated with the cost of testing, and the absence of 1L treatment available outside of clinical trials
- These data highlight the need for HER2 testing in patients with NSCLC to identify those who may benefit from targeted treatments

Abbreviations

1L, first line; 2L, second line; *ALK*, anaplastic lymphoma kinase; ECOG, Eastern Cooperative Oncology Group; *ERBB2*, erb-b2 receptor tyrosine kinase 2; *EGFR*, epidermal growth factor receptor; HER2, human epidermal growth factor receptor 2; HER2+, HER2-positive; HER2m, HER2-mutant; IQR; interquartile range; LAM, locally advanced or metastatic; LoT, line of treatment; NSCLC, non-small cell lung cancer; PS, performance status; *ROS1*, proto-oncogene 1, receptor tyrosine kinase; SACT, systemic anticancer therapy; SD, standard deviation

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