Clinical outcomes among patients with advanced non-small cell lung cancer who received targeted therapy in a real-world setting

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CONCLUSIONS

- **1,201/2,158 patients with positive biomarkers received NCCN recommended treatment**
- **Biomarker-positive patients who received NCCN recommended treatment options had significantly longer mOS, mPFS, and mTTNT**
- **Current smokers and patients with squamous cell histology were less likely to receive targeted treatments**

LIMITATIONS

- This study only included patients from the TEMPUS oncology dataset, so generalizability is limited
- Survival outcomes are subject to survivorship bias and temporal selection bias
- Due to the nature of electronic health record data abstraction, the rate of biomarker testing could be underestimated
- NCCN Guidelines® have evolved and not all actionable driver mutations in 2021 appeared in the 2012–2018 guidelines

FUTURE DIRECTIONS FOR RESEARCH

- Future research is needed to assess biomarker testing trends over time
- Additionally, the characteristics of aNSCLC management providers and healthcare settings are needed to gain a comprehensive understanding of aNSCLC management patterns and barriers to testing in the real-world setting

INTRODUCTION

- For patients with aNSCLC, biomarker testing can help to determine appropriate treatment options and allow for more individualized treatment
- According to the National Comprehensive Cancer Network® Clinical Practice Guidelines in Oncology (NCCN Guidelines®) NSCLC (V.5.2021), patients with aNSCLC who harbor *EGFR*, *MET*, *BRAF*, or *KRAS* mutations, *ALK*, *ROS1*, or *RET* rearrangements, or *NTRK* variants, and/or a high PD-L1 level should receive an FDA-approved targeted treatment[1]

OBJECTIVE

- To assess real-world clinical outcomes in biomarker-positive patients with aNSCLC who received NCCN recommended treatment options compared with other therapies

METHODS

- Retrospective United States cohort study of patients with aNSCLC using the TEMPUS oncology dataset, with an observational period from January 1, 2012 through to December 31, 2020
- Patients diagnosed with stage IIIB–IV NSCLC (index date), ≥18 years of age, who were biomarker-(i.e. *EGFR, MET, BRAF, KRAS, ALK, ROS1, RET, NTRK* or PD-L1 ≥1%) positive, and who received at least one line of treatment were included
- Patients were stratified by receipt of NCCN NSCLC recommended treatment option (V.5.2021)[1] anytime following diagnosis
- Demographics were reported using descriptive statistics
- mOS, mPFS, and mTTNT were evaluated by treatment group using Kaplan-Meier analysis
- Clinical characteristics were evaluated as potential predictors of receipt of NCCN recommended treatment by logistic regression. ORs with 95% CIs were reported

RESULTS

- 2,158 patients met study criteria
  - 54.7% were female, median age (IQR) was 65.6 (58.8, 72.9) years, 62.8% were White, 9.7% Black or African-American, 10.3% other races, and 17.2% unknown race, and 92.2% were diagnosed at stage IV
- PD-L1 ≥1% (38.0%), *EGFR* (32.2%), and/or *KRAS* (30.3%) were the most common over-expressions/mutations (out of patients with positive biomarkers, n=2,158)
  - *ALK* (9.8%), *BRAF* (4.8%), *RET* (3.7%), *MET* (3.6%), *ROS1* (3.5%), and *NTRK* (0.4%) were less common
  - Most PD-L1-positive patients had a PD-L1 staining percentage of 1–49% (37.5%), only 0.4% had a PD-L1 staining percentage ≥50%
- 55.7% (n=1,201) of patients received NCCN recommended treatment options
  - Patients who received NCCN recommended treatment had significantly longer mOS (n=1,201; mOS, 24.73 months [95% CI: 22.49, 27.62]) than those treated with non-recommended therapies (n=957; mOS, 19.76 months [95% CI: 17.53, 22.59]) (p<0.001) (**Figure 1**)
  - Patients who received NCCN recommended treatment also had significantly longer mPFS (n=1,199; mPFS, 8.45 months [95% CI: 7.89, 9.01]; **Figure 2**) and mTTNT (n=1,199; mTTNT, 20.55 months [95% CI: 19.27, 23.71]) than those treated with non-recommended therapies (n=957; mPFS, 4.90 months [95% CI: 4.50, 5.36]; **Figure 2** and n=956; mTTNT, 11.05 months [95% CI: 10.00, 12.72]), respectively; both p<0.001
- Never smokers (vs current smokers; OR, 2.13 [95% CI: 1.82, 2.50]), patients of unknown or other race (vs White patients; OR, 1.45 [95% CI: 1.28, 1.64] and OR, 1.47 [95% CI: 1.26, 1.72], respectively), and patients who received two or more lines of treatment (vs one; OR, 1.19 [95% CI: 1.09, 1.30]) were significantly more likely to receive NCCN recommended treatment options (**Figure 3**)
- Patients with squamous or other/unknown histology (vs non-squamous; OR, 0.53 [95% CI: 0.47, 0.59] and OR, 0.54 [95% CI: 0.47, 0.63], respectively) or missing ECOG scores (vs ECOG 0; OR, 0.85 [95% CI: 0.75, 0.95] were significantly less likely to receive NCCN recommended treatment options (**Figure 3**)

Figure 1. Median overall survival in biomarker-positive patients by treatment group

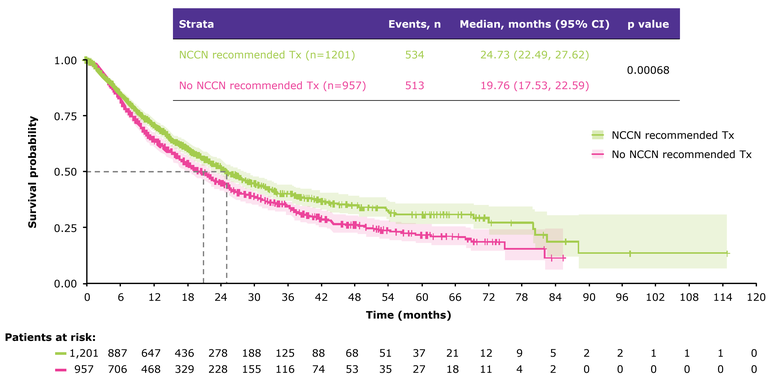


Figure 2. Median progression-free survival in biomarker-positive patients by treatment group

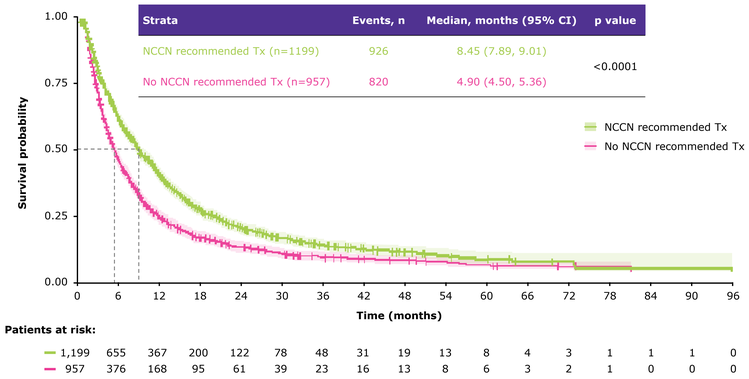
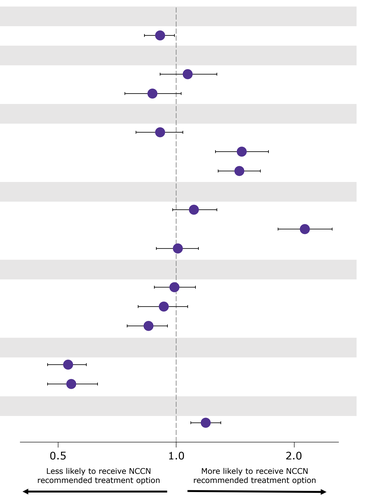


Figure 3. Patient characteristics associated with receipt of NCCN recommended treatment option



*Other race category included American Indian or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander, and other race. Reference groups are females, age ≤50 years, White race, current smoker, ECOG PS of 0, non-squamous histology, and line of treatment 1.

Abbreviations: 2+, second-or-later line; *ALK*, anaplastic lymphoma kinase; aNSCLC, advanced non-small cell lung cancer; *BRAF*, v-Raf murine sarcoma viral oncogene homolog B; CI, confidence interval; ECOG PS, Eastern Cooperative Oncology Group performance status; *EGFR*, epidermal growth factor receptor; FDA, US Food and Drug Administration; IQR, interquartile range; *KRAS*, kirsten rat sarcoma virus; *MET*, mesenchymal–epithelial transition factor; mOS, median overall survival; mPFS, median progression-free survival; mTTNT, median time to next treatment; NCCN, National Comprehensive Cancer Network®; NSCLC, non-small cell lung cancer; *NTRK*, neurotrophic tyrosine receptor kinase; OR, odds ratio; PD-L1, programmed death-ligand 1; *RET*, Ret proto-oncogene; *ROS1*, proto-oncogene tyrosine-protein kinase ROS; Tx, treatment.

References: 1. Referenced with permission from the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) for Non-Small Cell Lung Cancer V.5.2021. ©National Comprehensive Cancer Network, Inc. 2022. All rights reserved. Accessed April 14, 2023. To view the most recent and complete version of the guideline, go online to NCCN.org. NCCN makes no warranties of any kind whatsoever regarding their content, use or application and disclaims any responsibility for their application or use in any way.

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