Effective Epidermal Growth Factor Receptor (EGFR) Testing Rates in Advanced Stage Non-Small Cell Lung Cancer Patients Treated in Community Oncology Practices in the United States: Impact of a Decision Support Program

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ABSTRACT

- The current standard of care in advanced stage NSCLC patients who harbor EGFR mutations such as exon 19 deletions is small molecule targeted therapies.
- However, not all newly diagnosed patients receive biomarker testing prior to the start of first-line anticancer therapy (i.e. effective testing). Indeed, a proportion of these patients are offered a checkpoint inhibitor, even though such agents are of limited clinical benefit in EGFR mutation-positive disease.
- The objective of the current study was to measure the impact of a decision support program (DSP) created by EMOL Health on EGFR testing rates in advanced stage NSCLC patients treated in community oncology clinics across the United States (US).

METHODS

- The DSP consisted of multiple components such as early patient identification prior to their clinic appointment, their candidacy for benefiting from biomarker testing prior to the start of 1ST therapy, and links to NCCN guidelines for treating actionable mutations in advanced NSCLC.
- Prior to implementation, a random multistage sampling technique was used to identify 201 control patients who were managed at the Quality Cancer Care Alliance or the National Cancer Care Alliance, for a total of 34 community clinics across the US.
- The intervention group consisted of a random sample of 174 patients who were diagnosed following the launch of the DSP in participating clinics.
- The primary endpoint was effective testing rates, defined as the EGFR test being ordered and the results received by the oncologist before the initiation of therapy. Secondary endpoints consisted of overall testing rates, test outcomes, and therapies administered. Groups comparisons were presented as proportions with 95%CI and odds ratios (OR).

RESULTS

- Median patient age in the intervention and control group was 72 vs. 68 years, 53.4% vs. 48.4% were female, 31.0% vs. 27.9% were current smokers and 78.2% vs. 92.4% had stage IV disease.
- EGFR testing rates are presented in the Table 1 below. Overall testing rates were comparable between groups (OR = 1.33, p = 0.35).
- However, effective EGFR testing rates significantly increased by approximately 11.9% over the 12-month intervention period relative to the control period (OR = 1.74, p = 0.014).
- Furthermore, higher clinic interaction with the DSP (i.e. interacted ≥ 20 times) displayed a 3% absolute improvement in effective testing rates compared to lower levels of interaction (Table 2).
- Patient factors significantly associated with effective EGFR testing rates consisted of initial diagnosis being stage IV (vs. earlier stages), white race (vs. non-white) and tumor size, with bulkier tumors less likely to receive effective testing (Table 3).

Table 1. Impact of the DSP on overall and effective EGFR testing rates.

Outcome (95%CI)	Control Group (n=201)	Intervention Group (n=174)
Overall testing rate[1]	84.6% (95%CI: 78.8 to 89.3%)	87.9% (95%CI: 82.1 to 92.4%)
Effective testing rate[2]	62.2% (95%CI: 55.0 to 68.9%)	74.1% (95%CI: 67.0 to 80.5%)

[1] Odds ratio post vs. pre = 1.33, (95%CI: 0.70 to 2.54), p = 0.35. [2]Odds ratio post vs. pre = 1.74, (95%CI: 1.09 to 2.79), p = 0.014

Table 2. Impact of clinic interaction with the DSP on overall and effective EGFR testing rates.

Outcome (95%CI)	Clinics with < 20 interactions with the DSP over 12 months	Clinics with ≥ 20 interactions with the DSP over 12 months
Overall EGFR testing rate[1]	87.5% (95%CI: 78.2% to 93.8%)	88.3% (95%CI: 80.0% to 94.0%)
Effective EGFR testing rate[1]	72.5% (95%CI: 61.4% to 81.9%)	75.5% (95%CI: 65.8% to 83.8%)

[1] P > 0.05

Table 3. Patient factors significantly associated with effective EGFR testing.

Patient Factor	Odds Ratio	(95%CI)	Impact on Effective Testing
Stage IV	3.5	(1.29 to 9.28)	↑ 3.5 times
White race	0.26	(0.07 to 0.96)	↓ by 74%
Tumor size (cm)	0.89	(0.77 to 1.04)	Less likely with bulkier tumors

RESULTS

- The most common regimen following mutational testing was chemotherapy plus an anti-PD1 mAb (36.8%); chemotherapy alone (17.8%); and an EGFR TKI (11.9%) [Figure 1].
- 20 of the 31 EGFR mutation-positive patients (64.5%) received a single agent EGFR TKI.
- The median time to starting an EGFR TKI from the date that mutational test results were available was 7 days (IQR: 1 to 19).

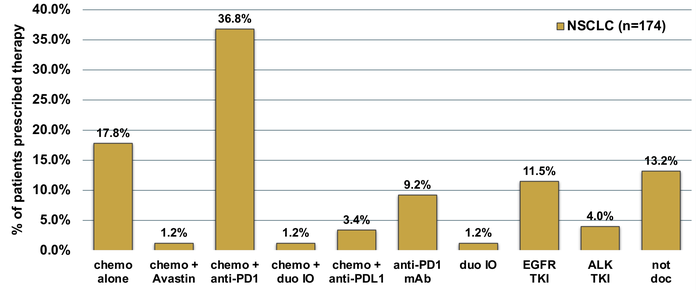

Figure 1. Therapy following mutation testing in the intervention group.

CONCLUSIONS

- Following the implementation of the DSP, the effective EGFR testing rate increased by 11.9% (74.1% vs. 62.2%, baseline), which is a relative increase of 74% (OR = 1.74, p = 0.014).
- Future initiatives to improve the impact of the DSP may include additional education, academic detailing and audit & feedback.
- Based on the results of this study EMOL Health will be:
  - ➢ Refining the DSP logic algorithms that identify biomarker results.
  - ➢ Refining the patient identification algorithm.
  - ➢ Creating a dashboard that will present real-time genomic testing rates among and between practices to support practice benchmarking programs.

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