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Treatment patterns and outcomes in patients with non-squamous advanced non-small cell lung cancer receiving second-line treatment in a community-based oncology network

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ABSTRACT

Objectives: This retrospective study used the US Oncology iKnowMed™ database, billing claims, and chart reviews to report treatment patterns and outcomes in late-stage non-small cell lung cancer (NSCLC) in US community oncology practices.
Materials and methods: Eligibility criteria included non-squamous NSCLC, stage IIIB/IV at diagnosis, ECOG performance status (PS) <3, and initiation of 2nd-line therapy (defined as index date) between 1/1/2007 and 6/30/2011 with ≥1 year follow-up. Key outcomes were overall survival (OS), progression-free survival (PFS), time-to-progression (TTP), and time-to-hospitalization (post-index date). Kaplan–Meier and Cox proportional hazard models were used to characterize the distribution and predictors of outcomes.
Results: 1168 patients were eligible for the study. The most frequent 2nd-line therapies were pemetrexed (54.4%), erlotinib-containing regimens (17.6%), and docetaxel (10.0%). Median OS and PFS were 7.5 (95% confidence interval [CI]: 6.6–8.4) and 4.1 (95% CI: 3.7–4.5) months, respectively; 57% of patients were hospitalized post-index date. EGFR testing rates were 2.3% before 2010, 15.2% in 2010, and 32.0% in 2011 ($P < .001$). Of EGFR-positive patients, 50.0% received erlotinib-containing regimens compared with 16.9% of EGFR-negative patients ($P = 0.001$). An increased risk of shorter time-to-hospitalization, after controlling for other covariates, was associated with PS = 1 (hazard ratio [HR] = 1.51; $P < .001$) or PS = 2 (HR = 1.68; $P = .001$) compared with PS = 0, pre-existing comorbid fatigue (HR = 1.64; $P = .003$) compared with no comorbid fatigue, and progression (HR = 1.92; $P < .001$), when it occurred, compared with no progression. Compared with other 2nd-line treatment, erlotinib-containing regimens prolonged adjusted TTP (HR = 0.69; $P = .015$).
Conclusions: This retrospective observational study provides new insights into treatment patterns, biomarker testing, and outcomes in advanced NSCLC within the context of a large community oncology network. Outcomes of these community practice patients, although poor, were similar to those reported in 2nd-line clinical trials for relevant regimens. EGFR testing in community practice rose rapidly after 2010.

1. Introduction

Lung cancer is the leading cause of cancer-related death worldwide [1]. Non-small-cell lung cancer (NSCLC), which accounts for 85% of all lung cancers, can be categorized primarily into squamous-cell carcinoma, non-squamous carcinoma (mostly adenocarcinoma), and large-cell lung cancer [2]. More than 60% of all patients with NSCLC are diagnosed with locally advanced or metastatic disease [3] and have a poor prognosis, with a 5-year survival rate of only 4% for those with metastatic disease [1].

Most patients with advanced NSCLC are candidates for chemotherapy, and first-line chemotherapy is associated with approximately 30% overall response, 4 months median progression-free survival (PFS) and median survival of 8–11 months [4,5]. For patients with epidermal growth factor receptor (EGFR) mutations/gene amplifications [6–8], erlotinib, an oral EGFR tyrosine kinase inhibitor (TKI) is also recommended as an additional first-line option [9].

In the United States, docetaxel, pemetrexed, and erlotinib are currently FDA approved for the 2nd-line treatment of unselected

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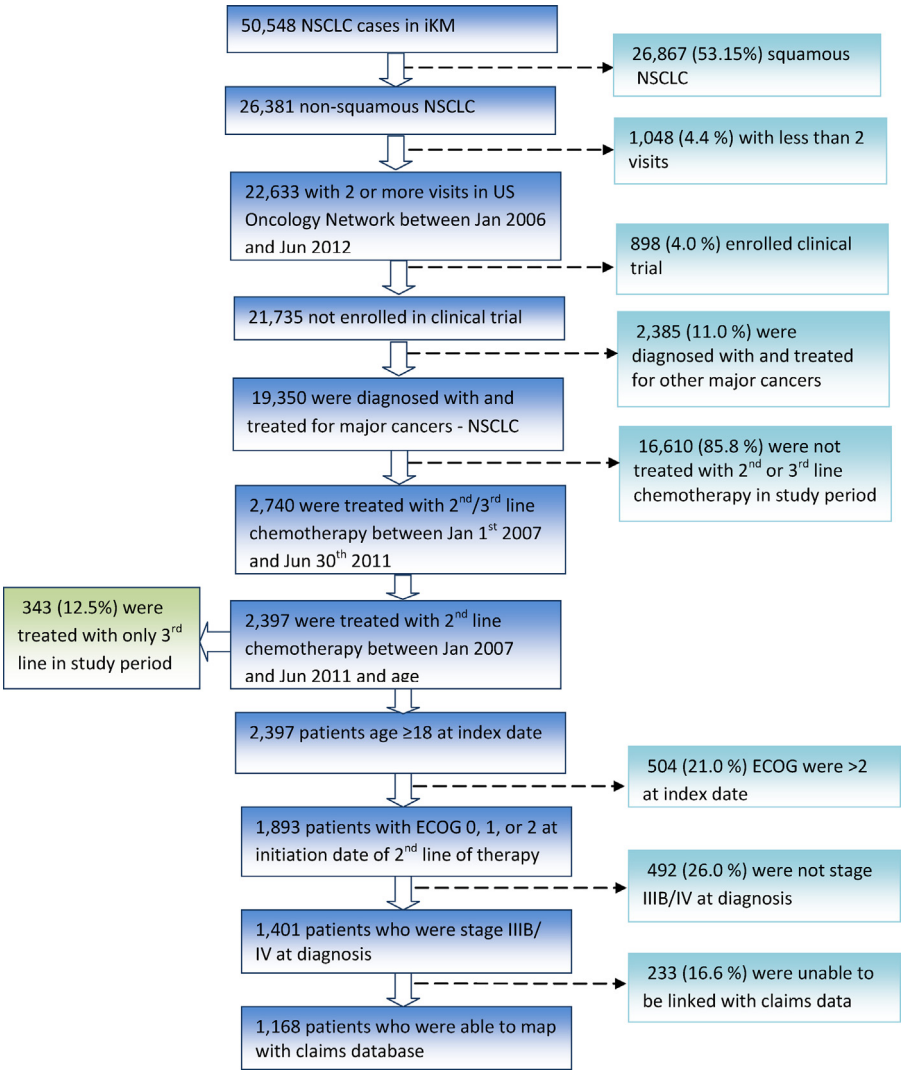

Fig. 1. Study sample flow chart.

NSCLC patients, with pemetrexed being specifically recommended for patients with non-squamous histology [9]. Although these agents differ with respect to mechanism of action, route of administration, and adverse event profile [10], they all have demonstrated a benefit of similar magnitude and have acceptable cost-effectiveness ratios (compared with best supportive care) in the US [11–14].

Patients with advanced NSCLC have more treatment options for targeted and intensive care than ever before. Not surprisingly, this adds to health care costs: the economic burden of lung cancer was estimated at as much as $12.1 billion in 2010 [15]. Thus, it is important not only to identify the key drivers of cancer costs but also to evaluate if cancer drug therapies are being optimally utilized based on demographics, histology, molecular biomarker findings, and other factors. For example, hospitalization accounts for as much as 80% of total treatment cost in advanced NSCLC [16]. Additionally, a significant proportion of the overall health care and individual financial burden of treatment is concentrated toward end-of-life or terminal phase in cancer patients [17,18].

Community oncology clinics constitute an important venue for cancer treatment in the US, with ~80% of cancer patients utilizing Medicare Part B receiving care in this setting [19]. Notably, receipt of cancer care in the community setting was associated with $6500 lower cost per patient compared to other settings [19]. For these reasons, it is important to investigate whether community cancer care in the US provides a level of personalized treatment that is commensurate with optimal outcomes observed in other settings. In the present study, we conducted an observational retrospective analysis to evaluate treatment patterns, NSCLC biomarker testing rates, clinical outcomes and hospitalization among patients receiving 2nd-line treatment for stage IIIB/IV non-squamous NSCLC in the community setting in the US.

2. Methods

2.1. Data source

This study used clinical data from iKnowMed™ (iKM) oncology-specific EHR system maintained by McKesson Specialty Health. This system captures demographic, clinical, laboratory, and treatment data for patients receiving care within US Oncology's network of approximately 1200 community-based oncologists. Patients with NSCLC identified in iKM EHR were linked to US Oncology's Claims Data Warehouse (CDW), a repository that houses all claims for all outpatient services provided within the US Oncology network. Data include charge codes (HCPCS/CPT), diagnosis codes (ICD 9-CM) and descriptions, date of service, quantity, amount billed, and primary payor. The Social Security Death Index (SSDI) was used to identify the vital status (death) of patients. Chart reviews were conducted to ascertain smoking status and completion of EGFR, KRAS,