Metastatic NSCLC: Treatment Patterns, Outcomes and Costs of Newer Agents

Adrian G Sacher MD, Lisa W Le MSc, Anthea Lau, Craig Earle MD MSc FRCPC, Natasha Leighl MD MMSc FRCPC

Background:

New therapies for metastatic NSCLC have improved survival in clinical trials. The increased cost of these agents has led to variable drug funding and treatment across jurisdictions. Here we review patterns, real-world outcomes and costs of metastatic NSCLC treatment in the province of Ontario.

Methods:

All patients diagnosed with metastatic NSCLC from 2005-2009 were identified from the Ontario Cancer Registry with demographic, histologic and mortality data. Treatment records from the Ontario New Drug Funding Program and centralized treatment database were linked. Statistical analysis involved Wilcoxon rank sum, Kruskal-Wallis, Cochran-Armitage trend and likelihood ratio tests where appropriate.

Results:

8113 metastatic NSCLC patients were identified. The median age was 68; 39% had adenocarcinoma, 14% squamous carcinoma and 43% histology not otherwise specified. Most were treated in regional cancer centers (92%). The majority (76%) did not receive systemic therapy; 23% received first-line chemotherapy, most commonly platinum doublets. More patients received systemic therapy over time (19% in 2005 *v* 26% in 2009, p <0.0001). Older patients (p <0.0001) and those with squamous histology (p <0.0001) were less likely to receive systemic therapy. Centre of diagnosis did not affect the likelihood of treatment (p=0.46). The median time from diagnosis to death was significantly greater among patients selected to receive chemotherapy (9.3 v 3.2 months, p <0.0001), and with cisplatin/gemcitabine compared to other doublets (10.7 v 8.2 months, p=0.004). 31% of treated patients received second-line chemotherapy, predominantly with docetaxel (52%) or pemetrexed (41%). Pemetrexed use increased significantly over time (8% in 2005 v 71% in 2009, p<0.0001), as did the mean drug cost of second-line therapy ($5939/patient in 2005 v $10,057 in 2009). A longer median survival was also seen with pemetrexed in adenocarcinoma (17.9 v 15.2 months for docetaxel, p =0.02).

Conclusions:

Most metastatic NSCLC patients do not undergo systemic treatment. First- and second-line treatment outcomes in this population-based study were similar to clinical trials, confirming better outcomes with new agents at greater cost.

April 13, 2012

NOYCIA Awards Committee

Dear Committee Members:

RE: **Dr. Adrian Sacher, MD**

        Letter of Support for NOYCIA

I am delighted to write a letter in support of Dr. Adrian Sacher's application for a NOYCIA for his abstract, "Metastatic NSCLC: Treatment Patterns, Outcomes and Costs of Newer Agents". He is a senior internal medicine resident at the University of Toronto, and is now entering the University of Toronto Medical Oncology Training Program. He has worked very hard on this interesting project, examining population-based practice patterns, costs and treatment outcomes in advanced non-small cell lung cancer, with a focus on the impact of introducing novel therapies. He will present his findings at this year's ASCO Annual Meeting.

Adrian has done an extraordinary job leading this project, with linkage of multiple large and complex administrative and cancer registry datasets to generate clinically relevant and important information. I have been particularly impressed with Adrian's development of his project, starting with conception, hypotheses and design, his presentations and collaboration with multiple stakeholders to obtain and link database access, and his work in directing the analysis and overseeing our statistical team to ensure data quality. He has written a very interesting abstract, including his demonstration that new therapies may actually improve population outcomes beyond what is predicted from clinical trial results. Adrian, despite being quite early on in his oncology training, is the most promising trainee I have ever worked with, and I have tremendous confidence in his future academic career in oncology. I give him my highest recommendation, without reservation, for this award.

Sincerely,

Natasha Leighl, MD FRCPC

Natasha Leighl, MD, MMSc (Clin Epi), FRCPC
Associate Professor, Dept. Medicine, University of Toronto
Staff Physician, Department of Medical Oncology and Hematology
Princess Margaret Hospital/University Health Network

5-105, 610 University Avenue, Toronto Ontario M5G 2M9
t.(416) 946-4645 f.(416) 946-6546 natasha.leighl@uhn.on.ca

ADRIAN SACHER

The project was initially conceived by Dr. Leighl and myself 2 years ago. I have been the primary researcher leading the project since that time. The project has entailed obtaining and analyzing extensive data on every patient treated for advanced non-small cell lung cancer (NSCLC) in Ontario between 2005 and 2009. The primary challenges associated with this project have been gaining approval to both obtain and link data from multiple sources, institutions and stakeholders as well as analyzing the resulting wealth of information.

I was solely responsible for the initial phase of the project involving obtaining research ethics and departmental approval for the project. Following this, I was primarily responsible for meeting with stakeholders at both Cancer Care Ontario (CCO) and the Institute for Clinical and Evaluative Sciences (ICES) in order to obtain approval in principle for the project. I subsequently drafted formal proposals to both and negotiated to secure access to the aforementioned patient data. I worked largely independently during this initial phase save for advice and guidance from Dr. Leighl.

Once approval from the various stakeholders involved in the project was obtained, the next phase of this project involved the delivery, refining and analysis of a large amount of data from multiple databases. During this phase, I was responsible for reviewing and interpreting demographic, histological, staging and treatment records on over 8000 patients. Given the complexity of this data and the associated multivariate analysis, I was assisted in the final analysis by members of the departmental biostatistical team.

In sum, I have been primarily responsible for the design, approval and data acquisition/analysis involved in this project. However, I could not have completed this project without the mentorship of Dr. Leighl and key guidance from the biostatistics team at Princess Margaret Hospital (Lisa Le, Anthea Lau).

Contribution percentage: 90%