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Population-based outcomes for small cell lung cancer: impact of standard management policies in British Columbia

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Summary Survival data for small cell lung cancer (SCLC) is typically reported from clinical trials or institutional series that include patients fit enough to meet treatment criteria. The denominator of all SCLC patients from which the treated population is derived is rarely reported and the impact of new treatment strategies on population-based outcomes is difficult to measure. The British Columbia Cancer Agency (BCCA) is a single centralized agency that coordinates cancer treatment services in the province and develops and circulates province-wide treatment guidelines. All SCLC cases diagnosed in BC in 1990 and 1995 ($n = 331$ and 297, respectively) were identified. These 2 years were chosen specifically to examine the impact of a change in practice guidelines from consolidative to early concurrent thoracic radiation (RT) for patients with limited stage disease. Demographic, staging, treatment, and outcome details were obtained for 100% of cases. A total of 628 patients were reviewed, 207 with limited stage disease (LSCLC) and 407 with extensive stage disease (ESCLC); 14 cases diagnosed at post-mortem were excluded. Of the 207 patients with LSCLC disease, 170 (82%) received chemotherapy, and 138 (81%) of those that received chemotherapy also received thoracic radiation. A similar proportion (73 and 70%) of LSCLC patients received thoracic RT in both years but more patients in 1995 received early concurrent versus consolidative thoracic RT compared to those treated in 1990 (64% versus 17%, respectively, $P = 0.001$). Of the 407 patients with ESCLC, 71% received chemotherapy. The median overall survival for all patients was 7 months. Patients with LSCLC who received any chemotherapy had a median survival of 14.3 months (26.9 and 9.9% for 2- and 5-year survival, respectively). Patients with LSCLC who received chemotherapy plus thoracic RT had a median survival of 15.1

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months (32 and 12% for 2- and 5-year survival, respectively). Early concurrent thoracic RT in LSCLC was associated with an improved 5-year survival from 9.6 to 16.3% ($P = 0.91$). Patients with ESCLC who received any chemotherapy had a median survival of 8.4 months (7.3 and 2.3% for 2- and 5-year survival, respectively). Standard treatment guidelines generated population-based survival outcomes that are similar to published clinical trials.

1. Introduction

Lung cancer is notoriously difficult to treat and remains a significant cause of world-wide morbidity and mortality. Efforts to improve treatment modalities over the last 20 years have yielded little in the way of substantial improvements perhaps leading to a somewhat nihilistic approach to the treatment of lung cancer. This may also help to explain the variability of treatment approach and outcome world-wide [1—4].

Small cell lung cancer (SCLC) is a distinct pathologic entity representing approximately 15% of lung cancers in British Columbia (BC). Its unique natural history and response to therapy make diagnosis at an early stage essential for cure. With chemotherapy alone approximately 9% of patients with limited stage disease (LSCLC) will be long-term survivors [5,6]. This improves to 20—25% with integrated chemoradiation [7—13]. Patients with extensive stage disease (ESCLC) have a significantly worse outcome with only 1—2% surviving after 5 years [14—16].

A major objective of clinical trials is to identify interventions that can improve survival and be extrapolated into general clinical practice. The main sources of cancer survival statistics are institutional series or clinical trials and such patient populations are highly selected. Trials tend to be restrictive with respect to their eligibility criteria and in combination with possible referral biases and investigator screening biases this results in a better prognostic group of patients than could be expected in the general population of small cell lung cancer patients [17]. These selected populations may result in a potentially artificial set of treatment standards and outcome expectations. Population-based studies eliminate selection and referral bias. Such studies have looked at this issue in breast cancer [18], lung cancer, in general [2,19—21], and small cell lung cancer [15,22,23].

This study is a population-based review of the demographics, staging, treatment, follow-up, and survival for patients with SCLC in British Columbia diagnosed in 1990 and 1995. These years were chosen specifically to allow a minimum of 5 years of follow-up, and to evaluate the impact of changes in treatment recommendations that occurred over that time [7—10,12].

2. Patients and methods

2.1. Setting

The province of British Columbia is 450,000 km^2 and has a population of 4 million. The British Columbia Cancer Agency (BCCA) has the mandate for cancer control in the province including the maintenance of the BC Cancer Registry, operation of cancer screening programs, provision of all radiation therapy (RT) and management of the budget for all antineoplastic drugs. Currently, the agency has four geographical sites within the province. No private radiotherapy facilities exist in British Columbia and therefore all radiation therapy is delivered at one of the four BCCA centers. Chemotherapy is generally coordinated through the BCCA, but may be given by a physician in the community. Comprehensive universal health care ensures that treatment is not restricted for financial reasons. The centralized nature of the BCCA allows for consensus statements and treatment recommendations to be circulated to all physicians who treat cancer in British Columbia. These evidence-based guidelines are generated by a multi-disciplinary panel of experts in the field and are reviewed and updated regularly. They are available on-line (http://www.bccancer.bc.ca); prior to 1997 a printed copy was distributed regularly.

2.2. Data sources

The BC Cancer Registry was used to identify all cases of SCLC diagnosed in British Columbia in 1990 and 1995 ($n = 628$). The BC Cancer Registry has a 93.5% case completeness ascertainment rate (according to the North American Association of Central Cancer Registries). The data are entered prospectively and updated regularly.

For cases referred to the BCCA (458/628; 73%) BCCA charts were used to retrospectively record demographic, pathology, staging investigation, treatment and outcome information. For cases not referred to the BCCA, similar data for each