Lung Cancer 100 (2016) 85–89

Contents lists available at ScienceDirect

Lung Cancer

journal homepage: www.elsevier.com/locate/lungcan

Current patterns of care for patients with extensive stage small cell lung cancer: Survey of US radiation oncologists on their recommendations regarding thoracic consolidation radiotherapy

Timur Mitin (Assistant Professor)*, Aditya Jain, Catherine Degnin, Yiyi Chen, Mark Henderson, Charles R. Thomas Jr

Oregon Health & Science University, Portland, OR, United States

ARTICLE INFO

Article history:
Received 28 July 2016
Received in revised form 1 August 2016
Accepted 10 August 2016

Keywords:
Extended-stage small cell lung cancer
Thoracic radiation therapy
Survey
Practice patterns

ABSTRACT

Objectives: Current National Comprehensive Cancer Network (NCCN) guidelines recommend thoracic consolidation radiation therapy (TCRT) for patients with Extensive Stage Small Cell Lung Cancer (ES-SCLC) with response to systemic chemotherapy, based on two randomized clinical trials, which varied in patient selection and radiation therapy doses administered. The current pattern of practice among US radiation oncologists is unknown.

Materials and methods: We have surveyed practicing US radiation oncologist via a short online questionnaire. Respondents' characteristics and their self-rated knowledge base were analyzed for association with their treatment recommendations.

Results: We received 473 responses from practicing US radiation oncologists. Over half of respondents were practicing for over 10 years after completing residency training and 70% treated more than 10 lung cancer patients per year. 96% of respondents recommend TCRT for patients with ES-SCLC after systemic chemotherapy. Patient selection and radiation therapy doses vary greatly. High self-rated knowledge of individual clinical trials is associated with lower TCRT recommended doses. Patients treated at academic centers are less likely to receive TCRT than patients treated in private clinics ($p = 0.0101$).

Conclusion: Our analysis revealed that among the respondents, there was a very high adherence to current NCCN guidelines, which recommend TCRT for ES-SCLC patients with clinical response to systemic chemotherapy. The great variability in patient selection and radiation therapy doses is concerning and calls for future clinical trials to standardize treatment approaches and improve treatment outcomes among patients with ES-SCLC. Until such data exists and in light of poor long-term survival of patients with ES-SCLC, the shorter and less toxic regimen of 30 Gy in 10 fractions should be used as the standard of care and the more aggressive regimens studied on clinical protocols.

1. Introduction

Small Cell Lung Cancer (SCLC) is found in 10% of patients with lung cancer and is one of the least curable histological subtypes, with a 5-year survival of approximately 3.5% [1]. It is characterized by rapid growth and early metastases development [2,3]. At the time of diagnosis 70% of patients have extensive-stage SCLC (ES-SCLC), which is initially treated with systemic chemotherapy. For patients with ES-SCLC who respond to chemotherapy current National Comprehensive Cancer Network (NCCN) guidelines [4] recommend thoracic consolidation radiation therapy (TCRT), based on two clinical trials. A Yugoslavian single-institutional randomized trial (Jeremic et al., JCO) showed an overall survival benefit to addition of TCRT of 54 Gy in 36 fractions given twice a day in patients with complete response (CR) in metastatic sites and either CR or partial response (PR) in thorax [5]. A more recent northern European randomized trial (Slotman et al., Lancet) enrolled patients with any clinical response to systemic chemotherapy to 30 Gy of TCRT or no irradiation [6]. The trial failed to show a difference in the primary endpoint – overall survival (OS) at 1 year, but showed a significant improvement in OS at 2 years. Post-hoc analysis revealed that TCRT benefited only patients who had residual disease in thorax (PR) and not patients with CR in thorax [7]. A

* Corresponding author at: Department of Radiation Medicine, Oregon Health and Science University, 3181SW Sam Jackson Park Road, L337, Portland, Oregon 97239, United States.
E-mail address: mitin@ohsu.edu (T. Mitin).

http://dx.doi.org/10.1016/j.lungcan.2016.08.005
0169-5002/

recently published meta-analysis further supports improvement in OS and progression-free survival (PFS) with TCRT in ES-SCLC [8]. Recently a randomized phase II multi-institutional RTOG 0937 trial was closed early due to excessive grade 4 and 5 toxicity in patients randomized to 45 Gy of consolidation radiation to thorax and residual metastatic disease [9].

The current radiation practice patterns in the United States for patients with ES-SCLC are unknown. We designed an online survey to learn how radiation oncologists in the United States counsel patients with ES-SCLC regarding thoracic radiation therapy, what doses they prescribe in various clinical scenarios and what factors influence physicians' clinical recommendations.

2. Methods

2.1. Survey instrument development

The study was approved by the OHSU institutional review board. The online survey was developed with the REDCap software licensed by the Oregon Clinical and Translational Research Institute (OCTRI) for use by the Oregon Health and Science University (OHSU). The survey contained 22 potential questions regarding respondent demographics, thoracic consolidation radiation therapy practices (TCRT), prophylactic cranial irradiation therapy (PCI), and use of memantine with PCI. Branching logic was used to tailor the questions based on previous responses, so that most respondents did not see all 22 questions. Respondents self-rated their knowledge of three landmark trials for patients with ES-SCLC: Yugoslavian single-institutional randomized trial (Jeremic et al., JCO, which revealed improvement in overall survival for patients with complete response at distant sites and either complete or partial response in thorax, with addition of accelerated hyperfractionated RT to concurrent chemotherapy) [5], the northern European randomized trial NTR1527 (Slotman et al., Lancet, which showed improved OS at 2 years with addition of TCRT to patients with clinical response to chemotherapy) [6], and the RTOG 0937 trial (closed to accrual due to excessive toxicity in consolidation RT arm) [9]. Based on the response selection for the first two – Yugoslavian and European – trials, we have assigned a score of 0 ("Do not know this study"), 1 ("I know the main conclusion, but don't know the details of the trial and would not be able to quote the numbers") or 2 ("I have read the article and feel comfortable discussing the results"). Based on the response selection for the closed RTOG 0937 trial we assigned a score of 0 ("I am not familiar with this study"), 1 ("I am familiar with this study, but did not know it was closed to accrual due to toxicity early this year"), 2("I am familiar with this study and know that it was closed to accrual due to toxicity") and 3 ("I am familiar with this study and my institution enrolled patients on this study when it was open"). These individual scores were summed to obtain a knowledge score (KS) between 0 and 7, with 0 representing the least familiarity and 7 representing the expert level of knowledge. KS approached a normal distribution with a mean value of 3.81 (SD 1.86). The respondents were analyzed by three groups: low knowledge (KS 0–2), intermediate knowledge (KS 3–4), and high knowledge (KS 5–7).

2.2. Data collection

The data sample was collected through two internet-based, anonymized surveys of radiation oncologists in the United States. The survey was initially sent to 6967 potential participants from a developed database of radiation oncologists compiled through the American Society for Radiation Oncology (ASTRO) directory. These participants were then contacted through email using the REDCap tool and invited to take the survey. The invitation contained instructions on participation, contact information for questions, and usage of results. E-mail invitations were originally sent on September 7th, 2015. Participants who had requested to be removed due to non-applicability were not sent a reminder email, whereas potential respondents who did not complete the survey were contacted with a reminder email on September 15th, 2015 to maximize response rate.

Table 1
Characteristics of Radiation Oncologists who completed the survey.

	Number of respondents (%)
Number of years after completion of residency training	
Currently in residency training	37 (7.82%)
0–2	45 (9.51%)
3–5	67 (14.16%)
6–10	73 (15.43%)
over 10	251 (53.07%)
Number of lung cancer patients treated over the past 12 months	
0	17 (3.59%)
<5	42 (8.88%)
5–10	85 (17.97%)
>10	329 (69.56%)
Practice setting	
Academic Center	205 (43.34%)
Private Practice	268 (56.66%)
Practice region	
Central	116 (24.52%)
Northern	115 (24.31%)
Pacific	94 (19.87%)
Southern	103 (21.78%)
Western	45 (9.51%)

2.3. Statistical analysis

Respondents were characterized by years since residency completed, number of lung cancer patients treated in the past year, practice setting, region of practice, and the knowledge base, as discussed above. These five variables were analyzed for correlation with respondent treatment recommendations. Chi Square analysis was used to examine the correlations between characteristics and knowledge base with treatment questions. Cochran-Armitage test of trend was used to evaluate the trend in change for ordinal categorical variables. A p-value < 0.05 was considered statistically significant. SAS 9.4 (NY, Cary) was used for statistical analysis.

3. Results

3.1. Survey respondents

The survey was sent to 6967 email addresses, some of which could likely belong to the same individuals, as both personal as well as institutional email addresses were used. We received 499 failed/undeliverable automatic responses, 55 non-applicable/ineligible responses and 497 completed responses, among which 24 were from non-radiation oncologists, thus excluded from analysis. Characteristics of 473 radiation oncologists who completed the survey are summarized in Table 1. Over half of respondents were practicing for over 10 years after completing residency training, and 70% treated more than 10 lung cancer patients per year. Respondents self-rated on their knowledge of three landmark trials for patients with ES-SCLC, as described in Methods. Distribution of respondents was split with 25% in the low knowledge, 37% in the intermediate knowledge, and 38% in the high knowledge categories.