Use of hypofractionated radiotherapy with concurrent chemotherapy (HF-CRT) in inoperable Stage II/III non-small cell lung cancer (NSCLC)

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INTRODUCTION

Precision hypofractionated radiation therapy (PHRT) without concurrent chemotherapy in inoperable Stage II/III non-small cell lung cancer (NSCLC) appears to be safe and effective in early results from randomized trials.

Benefits of PHRT:
- Higher BED
- Shorter treatment time
- Time and cost effective
- More convenient for the patient

However, the safety and efficacy of PHRT with concurrent chemotherapy is not well studied.

AIMS

To study the use and outcomes of hypofractionated (HF)-CRT in the United States.

MATERIAL & METHODS

We searched the National Cancer Database (NCDB) for Tany N+ M0 NSCLC diagnosed 2004-2013 that received chemotherapy and radiotherapy (RT) in their primary course of treatment. Conventional fractionated chemoradiation (CF-CRT) was defined as 58-80 Gy in 30-45 fractions. Hypofractionated chemoradiation (HF-CRT) was defined as 45-60 Gy in 15 fractions.

Patient demographic, diagnosis, and treatment information and overall survival (OS) were compared with descriptive statistics, multivariable logistic regression, and single and multivariable survival analyses. Propensity score matching was used to try to reduce selection bias and confounding variables between the two groups.

RESULTS

A total of 126 (0.5%) patients received HF-CRT and 24,286 (99.5%) patients received CF-CRT. Even before 1:1 propensity score matching, the two groups were similar in demographics, Charlson-Deyo comorbidities score, and grade. Before matching, the HF-CRT group was more likely to be treated at academic research facility than CF-CRT group (52% vs 30%, p<0.0001), but after matching, 52% of both groups were treated at an academic/research facility.

On univariable and multivariable survival analysis, CF-CRT was associated with better overall survival (OS). On Kaplan-Meier analysis, 1-year and median OS were 68% and 15 months for CF-CRT vs 46% and 10 months for HF-CRT, respectively, with hazard ratio (HR) of 1.9 (95% confidence interval [CI] 1.3-2.7) on MVA. Female gender, later year of diagnosis, living in East/Atlantic region, and unknown grade were also associated with higher OS.

CONCLUSIONS

❖ Use of HF-CRT has been uncommon in the US in the past decade.
❖ Interpretation of outcomes is limited due to the retrospective nature of this study, the unavailability of dosimetric data, and the small cohort.
❖ This provides information on real-world usage and outcomes of new treatment regimens currently under consideration in clinical trials.
❖ While a recently presented randomized phase 3 trial from UTSW showed comparative outcomes between PHRT and CRT, our retrospective study raises hypotheses concerning the safety of combining hypofractionated radiation with concurrent chemotherapy. Carefully designed prospective clinical trials with strict dosimetric guidelines will be required to understand the feasibility of combining PHRT with systemic agents.

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