Impact of radiotherapy timing after induction chemotherapy on survival of patients with locally advanced Non Small Cell Lung Cancer

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Introduction

As 40% of patients with Non Small Cell Lung Cancer (NSCLC) have locally advanced unresectable disease, combined chemotherapy and radiotherapy (ChRT) is considered to be the first choice therapy for most of them. Concurrent ChRT has been demonstrated in meta-analyses to give superior outcomes when compared with sequential ChRT or RT alone. However, more than one-half of patients with locally advanced NSCLC are currently thought to be ineligible for concurrent regimens.

The aim of our analysis was to show whether the radiotherapy timing after induction chemotherapy (ChT) had an impact on survival of patients with locally advanced NSCLC.

Methods

A retrospective study of all patients (80 pts) with Stages III NSCLC treated with definitive RT between 2010 and 2015 was performed. Fifty-six patients had squamous cell carcinomas and 24 had adenocarcinomas. Induction ChT followed by definitive RT, concurrent ChRT and RT alone were performed in 57, 11 and 12 pts, respectively. The chemotherapy regimen consisted of a combination of: platinum and paclitaxel or docetaxel; platinum and gemcitabine; platinum and vinorelbine; platinum and etoposide; or platinum and pemetrexed (median: 4 cycles, range 3-6). Median dose of definitive RT was 60Gy (range 56-70Gy over 5.5-7 weeks). Patients treated with induction ChT followed by definitive RT (57 pts) categorized on the basis of the interval between ChT and RT (<2 months and ≥2 months). The Kaplan-Meier method was used for survival and Barnard's test to compare differences in disease-free (DFS) and overall survival (OS) rates between these two groups of pts.

Results

Analysis of 2-year DFS demonstrated significant difference in those pts who underwent a definitive RT within 2 months of the induction ChT (25% for pts with interval < 2 months versus 11% for pts with interval ≥ 2 months)(p=0.001275). However, a statistically significant difference was not demonstrated in these patients regarding to the 2-year OS (25%, 19% pts, respectively, p=0.410881). Concurrent ChRT did not improve DFS (p=0.241590), however, significantly improved OS compared to the definitive RT after induction ChT (p=0.009008). Radiotherapy alone had the worst outcomes.

Conclusion

The findings from this analysis suggest that DFS may be significantly more inferior in patients with locally advanced NSCLC who undergo definitive RT later than 2 months after induction ChT. However, the radiotherapy timing after induction ChT had not an impact on OS of our patients.