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Summary of Research Results for NRG-RTOG 1106/ECOG-ACRIN 6697: *A Randomized Phase II Trial of Individualized Adaptive (chemo)Radiotherapy Using Midtreatment FDG-PET/CT in Stage III NSCLC*

Introduction

This summary reviews the main results of the study. There may be benefits and risks to learning study results. A benefit for some people is knowing that they contributed to the research and their participation is appreciated. Another benefit is what was learned from the study may help them make decisions about their health care now or in the future.

For some people, a risk is getting results that make them feel distressed or remember a difficult time in their lives. Some people may feel upset about the study results if the study did not help their condition.

Please talk with your doctor about any questions you may have about this summary. Your doctor can help explain these results to you in relation to your medical concerns.

NRG Oncology thanks you for your participation in this research. Your participation has helped us learn about and advance cancer care.

Background of the study

The purpose of this study was to find out if higher dose radiation treatment based on the FDG-PET/CT imaging adapted planning improves treatment locally advanced non-small cell lung cancer (NSCLC) with the same possible damage to healthy lung tissue compared to treatment with standard radiation therapy. The higher dose radiation was aimed at the tumor. The doses to normal tissues, such as heart, spinal cord, and esophagus were strictly limited and were kept at the same safe limits as in standard radiation.

What did the study involve?

After enrolling on this study, participants were randomized to one of two study groups. Both groups received an FDG-PET/CT scan during the course of their treatment.

Group 1 received standard radiation treatment once daily, 5 days a week for 6 weeks, and chemotherapy (paclitaxel and carboplatin), once a week for 6 weeks. They had during-radiation FDG-PET/CT scans for treatment response assessment, when it showed that disease had spread outside the chest, treatment may have been stopped because it might not be effective.

Group 2 received radiation treatment once daily, 5 days a week for 6 weeks. This radiation treatment was a higher dose per day than standard radiation in group 1. Patients in this group also received chemotherapy (paclitaxel and carboplatin), once a week for 6 weeks. Their radiation therapy plan was changed partway through based on their during-radiation FDG-PET/CT scan. This radiation treatment was a higher dose to the residual tumor per day than standard radiation-while the dose to the volume of pre-treatment planning margin was reduced and the estimated risks of lung toxicity and other normal organs were kept within the safe limit of standard practice. If their during-radiation FDG-PET/CT scan showed that disease had spread outside the chest, treatment may have been stopped because it might not be effective.

Both groups received paclitaxel and carboplatin by vein every 21 days, for a total of 3 cycles of chemotherapy four to six weeks after radiation treatment was completed.

What were the major findings of the study?

Between February 22, 2012, and March 8, 2017, 138 patients were accrued from 27 institutions. Of these patients, 127 were eligible for the study, including 43 patients assigned to the standard treatment arm, and 84 assigned to adaptive RT. There was no significant difference in tumor control in the primary tumor site and -regional nodal area between the two treatment arms. Both treatment arms also showed no significant differences in serious toxicities, patient survival, or tumor progression-free survival during the 2 year observation time.

No patient had cancer progressed during the course of concurrent radiotherapy in either groups.

Differing from the results of RTOG0617, this study demonstrated no detrimental effect of high dose radiation which suggests that the mid-treatment PET-guided adaptive technique had at least partially reversed life threatening toxicity from the uniform high dose radiation therapy.

Are there any steps that may need to be taken at this time or in the future for those who participated in the study?

For participants in this study, there are no immediate or long-term steps that need to be considered because of these findings. All participants in this study have completed their treatment and should be followed by their doctor.

What did the researchers learn that will be helpful to other people with this condition?

Based on the study results, it was determined that midtreatment, personalized dose escalated radiation therapy using PET given in this study is a safe and treatment option for patients, but did not add to the effectiveness of the standard treatment. High dose radiation may not be

detrimental to survival should adaptive approach be used to keep doses to normal organs unchanged.

Who can I contact for further information?

Please talk with your doctor about any questions or concerns you may have about this summary. Further details about the design, conduct and results of this study are available at www.clinicaltrials.gov.

List of publications with references that were generated from this study.

Feng-Ming (Spring) Kong et al., Primary Results of NRG-RTOG1106/ECOG-ACRIN 6697: A Randomized Phase II Trial of Individualized Adaptive (chemo)Radiotherapy Using Midtreatment ^{18}F-Fluorodeoxyglucose Position Emission Tomography/Computed Tomography in Stage III Non–Small Cell Lung Cancer. *JCO* **0**, JCO.24.00022 DOI:10.1200/JCO.24.00022