

Modest acute changes in cardiac biomarkers and electrocardiogram findings following thoracic radiation therapy

September 24 2014, by Murry W. Wynes, Phd

There were only modest acute changes in cardiac biomarkers and electrocardiograms and there were no clinically significant cardiac events in patients with high-dose radiation exposure to the heart following thoracic radiation therapy (RT) and short-term follow-up.

Radiation therapy is standard of care for some [patients](#) with thoracic malignancies such as [lung cancer](#), esophageal cancer, thymoma, or malignant mesothelioma. Radiation exposure to the heart is avoided when possible but even with advanced radiation therapy techniques there are instances when high [radiation exposure](#) to the heart is inevitable. The effects of acute high-dose exposure are not well defined.

Researchers at The University of Texas MD Anderson Cancer Center prospectively evaluated the cardiac function biomarkers brain natriuretic peptide (BNP), troponin-I (TNI), and electrocardiogram (ECG) in 25 patients receiving high-dose conformal [radiation therapy](#) for thoracic malignancies. Expected exposure to the heart was ≥ 20 GY. Biomarker measurements were taken before RT, within 24 hours of the first dose, on the day of the last dose, and at first follow-up 1-2 months after completion of RT.

The results published in the October issue of the *Journal of Thoracic Oncology*, the official journal for the International Association for the Study of Lung Cancer, show that TNI levels were undetectable in all

patients before RT and increased slightly in 2 patients following RT but these returned to undetectable levels at the first follow-up. Changes in BNP were not correlated with mean heart dose on day 1, the final day of treatment, or at the first follow-up. One patient did have greatly increased BNP after the first dose but subsequently returned and stayed at approximately normal levels. In the collective population the mean BNP levels were slightly elevated at the end of RT and at first follow-up, but this may be attributable to the effect of chemotherapy on BNP in those patients that received concurrent chemotherapy and radiation. Twelve patients had some change in ECG readings at varying points in therapy but most resolved by the next measurement, were asymptomatic, and none required management.

Dr. Daniel Gomez, lead author on this study, acknowledges that the goal of this study was to "observe if short-term trends could be observed in the acute setting but we are continuing to follow these patients and intend to pool the results of this study with those involving other patients with locally-advanced disease to determine whether further toxicity arises that warrants longer follow-up with these metrics". The authors suggest that for the future "A more complete clinical analysis should entail follow-up for at least 2 or 3 years and with an increased dose range; such a design presumably would reveal the impact of dose on both acute and late RT-related toxicity and thereby strengthen the associations observed in this analysis of acute effects".

Provided by International Association for the Study of Lung Cancer

Citation: Modest acute changes in cardiac biomarkers and electrocardiogram findings following thoracic radiation therapy (2014, September 24) retrieved 18 April 2024 from <https://medicalxpress.com/news/2014-09-modest-acute-cardiac-biomarkers-electrocardiogram.html>

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