Decades after childhood radiation, thyroid cancer a concern

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When children are exposed to head and neck radiation, whether due to cancer treatment or multiple diagnostic CT scans, the result is an increased risk of thyroid cancer for the next 58 years or longer, according to University of Rochester Medical Center research.

The study is believed to be the longest of any group of children exposed to medical irradiation and followed for thyroid cancer incidence. It was published in the December 2010 edition of the journal, *Radiation Research*.

The data also might provide some insight about why the rates of thyroid cancer continue to rise, as the general public is increasingly exposed to higher doses of radiation through more frequently used imaging tests such as computed tomography (CT), said lead author Jacob Adams, M.D., M.P.H., an associate professor in the Department of Community and Preventive Medicine at URMC

"Ionizing radiation is a known carcinogen and, in fact, about 1 million CT scans are performed every year on children five years or younger," Adams said. "Although CTs and other imaging tests are an important diagnostic tool and radiotherapy is an important treatment modality for cancer, with everything comes a risk. Our study attempted to measure the very long-term impact on thyroid cancer from medical irradiation. Our findings strongly suggest that those individuals exposed to irradiation from multiple CT scans to the head, neck and chest during early childhood and individuals treated with radiotherapy to the upper

body as children have a lifelong increased risk of thyroid cancer."

Adams and colleagues indirectly evaluated the future risks of modern patients by assessing the rates of thyroid cancer in a group that was treated with lower-dose chest radiotherapy in Rochester, N.Y., between 1953 and 1987. The cohort had been treated during infancy for an enlarged thymus, a condition that physicians used to believe was a health problem. None of the radiation administered was for cancer, and thus the research is not confounded by a susceptibility to the disease.

Adams re-surveyed the population between 2004 and 2008, and compared the health status of the group to their siblings who had not received radiation. Thyroid cancer occurred in 50 of the 1,303 irradiated patients compared to only 13 of the 1,768 siblings. The association between radiation and thyroid cancer remained strong even after researchers accounted for other factors that could contribute to thyroid cancer risk.

Radiation doses in the mid-century group overlapped with current medical practices; however, in general, higher doses and less precision were used years ago. Doses at the lower end of the study cohort were comparable to a diagnostic pediatric chest CT given today, the study said. Not surprisingly, researchers found that thyroid cancer risk increased with higher doses of radiation.

The Rochester study confirmed the findings of a pooled review of five earlier population studies, and adds to the literature by showing that, at least in children, the risk of cancer due to radiation exposure continues for a median of 57.5 years.

Provided by University of Rochester Medical Center

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