



THYROID CANCER

Thyroid cancer in children near the Fukushima Daiichi Nuclear Power Plant meltdown

BACKGROUND

Thyroid cancer is the fastest rising cancer, especially in women. While the cause of this increase in thyroid cancer is largely unknown, it is known that the risk of thyroid cancer is increased for those who are close by a nuclear power plant accident, as a result of exposure to radiation emitted from the accident. The thyroid gland in children appears to be acutely sensitive to the results of radiation, as there was a marked increase in thyroid cancer after the Chernobyl nuclear plant meltdown in 1986. The Fukushima Daiichi Nuclear Power Plant in Japan experienced a nuclear meltdown on March 11, 2011 following a large earthquake in the area. As a result, there has been concern of increased thyroid cancer risks in the people who were close by at the time. This study examined the risks of developing thyroid cancer in children who were nearby the Fukushima nuclear emergency.

THE FULL ARTICLE TITLE

Suzuki S et al Comprehensive survey results of childhood thyroid ultrasound examinations in Fukushima in the first four years after the Fukushima Daiichi Nuclear Power Plant accident. *Thyroid*. 2016 Apr 20. [Epub ahead of print]

SUMMARY OF THE STUDY

This was a study of over 300,000 children (defined as less than 18 years old) who were living close by the Fukushima power plant at the time of the nuclear emergency in 2011. Between 2011-2015, all children received a thyroid ultrasound as part of a mass screening effort. The researchers plan to repeat thyroid ultrasound every 2 years until the children reach age 20, then every 5 years indefinitely. The researchers also asked the children questions related to their exact location and activity level at the time of the nuclear accident, in order to estimate the dose of radiation exposure.

Over this 4-year time period, children who had concerning features on the initial thyroid ultrasound received a more detailed thyroid ultrasound examination, from which some were also recommended to have a thyroid nodule biopsy. Based on the biopsy results, 99 children eventually underwent thyroid surgery, of which over 99% were confirmed to have thyroid cancer. Children with the thyroid cancer results were aged 6-18 years at the time of the nuclear accident. Overall, the researchers found that the rate of new-onset pediatric thyroid cancer following the Fukushima nuclear accident was 37.3/100,000 individuals. In comparison, the rate of new-onset pediatric thyroid cancer in the United States was 0.54/100,000 individuals.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study provides further information regarding the risks of radiation exposure among children after a nuclear accident. The rate of thyroid cancer found in children in the 4 years following the Fukushima accident is much higher than both the general population rates of pediatric thyroid cancer and as well as following other historic nuclear accidents, including the Chernobyl disaster in 1986. This is likely because of the dedicated mass screening effort done in Fukushima, which was not done in such a rigorous way after Chernobyl. It will be important to follow the children in this study through adulthood to see how beneficial mass screening is following a nuclear accident.

— Angela M. Leung, MD, MSc

ATA THYROID BROCHURE LINKS

Thyroid Cancer: <http://www.thyroid.org/thyroid-cancer/>
Childhood Head and Neck Irradiation: <http://www.thyroid.org/pediatric-endocrinology/>

ABBREVIATIONS & DEFINITIONS

Thyroid nodule: an abnormal growth of thyroid cells that forms a lump within the thyroid. While most thyroid nodules are non-cancerous (benign), ~5% are cancerous.

Thyroid Ultrasound: a common imaging test used to evaluate the structure of the thyroid gland. Ultrasound uses soundwaves to create a picture of the structure of the thyroid gland and accurately identify and



THYROID CANCER, continued

characterize nodules within the thyroid. Ultrasound is also frequently used to guide the needle into a nodule during a thyroid nodule biopsy.

Thyroid fine needle aspiration biopsy (FNAB): a simple procedure that is done in the doctor's office to determine if a thyroid nodule is benign (non-cancerous) or cancer. The doctor uses a very thin needle to

withdraw cells from the thyroid nodule. Patients usually return home or to work after the biopsy without any ill effects.

Thyroidectomy: surgery to remove the entire thyroid gland. When the entire thyroid is removed it is termed a total thyroidectomy. When less is removed, such as in removal of a lobe, it is termed a partial thyroidectomy.

