



CHILDHOOD CANCER AND THYROID DISEASE

Childhood cancer survivors are at high risk for thyroid and other endocrine disorders

BACKGROUND

It is estimated that there are currently 420,000 survivors of childhood cancers in the United States. There has been a significant progress in the treatment of many childhood cancers and the overall 5-year survival rate is >80%. Different cancer treatments, such as radiation therapy to the neck, which may affect the thyroid, or the head, which may affect the hypothalamus/pituitary, can result in endocrine problems. It is expected that many childhood cancer survivors will develop endocrine abnormalities years after the cancer treatment. To date, there is only limited published data on long term follow-up of these patients. This is the largest study evaluating the development of endocrine disorders over an extended period of time in childhood cancer survivors according to the treatment received.

THE FULL ARTICLE TITLE

Mostoufi-Moab S et al Endocrine abnormalities in aging survivors of childhood cancer: a report from the Childhood Cancer Survivor Study. *J Clin Oncol*. July 5, 2016 Jul 5 [Epub ahead of print].

SUMMARY OF THE STUDY

The study included a total of 14,290 patients from the Childhood Cancer Survivor Study (NCSS), a multi-institutional study including long-term survivors of various childhood cancers treated at 26 U.S. or Canadian institutions. Patients were diagnosed with leukemia, central nervous system cancers, Hodgkin's or non-Hodgkin's lymphoma, Wilms' tumor, neuroblastoma, sarcoma, or bone cancer before age 21. They received cancer treatment between 1970 and 1986 and survived for at least 5 years after diagnosis. The cancer survivors or family members completed a baseline survey between 1994 and 1999 and then follow-up surveys in 2000, 2003, and 2007 regarding personal/family medical history, including development of endocrine disorders and age at diagnosis. A total of 4031 randomly chosen siblings of the study participants who did not have cancer were used for comparison. Cancer diagnosis and treatment data, especially treatments known to affect the endocrine system, such as thyroid, hypothalamic/

pituitary, testicular/ovarian, and total-body irradiation were retrieved from medical records.

The average age at cancer diagnosis was 6 years and the average age at final follow-up was 32 years. In the survivor group, 83% were white, 5% black, and 5% Hispanic; the rest had either mixed or unknown ethnicity. Among the survivors, 44% had at least one self-reported endocrine disorder, 16.7% had at least two, and 6.6% had three or more. Hodgkin's lymphoma survivors had the highest frequency of endocrine disorders.

All survivors, and especially those who were exposed to thyroid or hypothalamic-pituitary irradiation had a higher risk of developing thyroid disorders with increasing age, including an underactive or overactive thyroid, thyroid nodules, and thyroid cancer as compared to siblings.

Overall, survivors had the same risk for obesity but a higher risk for diabetes as compared to siblings. Survivors treated with higher doses of cranial irradiation had an almost two-fold greater risk of obesity, while survivors who received abdominal irradiation or total body irradiation had an almost two-fold greater risk of diabetes as compared to survivors not exposed.

The risk for ovarian/testicular failure was increased in survivors exposed to ovarian/ testicular irradiation, hypothalamic/pituitary irradiation or cyclophosphamide, as compared with survivors without those exposures.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

All childhood cancer survivors have a higher risk to develop an underactive or overactive thyroid, thyroid nodules, thyroid cancer, and other endocrine disorders than their siblings who did not have cancer, with the risk increasing steadily over time. The risk of thyroid disorders is particularly high in survivors with history of head or neck radiation exposure. These findings underscore the importance of life-long screening for endocrine abnormalities in childhood cancer survivors.

—Alina Gavrilă, MD, MMSC



CHILDHOOD CANCER AND THYROID DISEASE, continued

ATA THYROID BROCHURE LINKS

Hypothyroidism: <http://www.thyroid.org/hypothyroidism/>

Hyperthyroidism: <http://www.thyroid.org/hyperthyroidism/>

Thyroid cancer: <http://www.thyroid.org/thyroid-cancer/>

ABBREVIATIONS & DEFINITIONS

Hypothalamus: part of the brain that controls secretion of hormones by the pituitary gland and participate in regulation of different body processes, including body temperature, hunger, and thirst.

Pituitary gland: this endocrine gland sits at the base of the brain and secretes hormones that control thyroid and adrenal function, growth and reproduction. The pituitary gland secretes TSH to control thyroid function.

Thyroid nodule: an abnormal growth of thyroid cells that forms a lump within the thyroid. While most thyroid nodules are non-cancerous (benign), ~5-10% are cancerous.

