Absolute Risk Prediction of Second Primary Thyroid Cancer for 5-year Childhood Cancer Survivors Based on Patient-reported Treatment History

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Abstract

Compared to the general population, survivors of childhood cancer are at increased risk of developing second primary thyroid cancer (SPTC) in adulthood. The risk of SPTC is most elevated for patients who received radiation therapy as part of the treatment of the first primary cancer. We present absolute risk prediction models for SPTC among 5-year childhood cancer survivors using pooled SPTC outcomes from the Childhood Cancer Survivor Study (CCSS) in North America and Canada, the Late Effects Study Group and the CCSS of the five Nordic countries. A patient-based prediction model includes risk factors that could be obtained from patient-self report, which would be the most feasible for use in the clinical setting. The predictive performance of this model is compared to one that includes treatment information that might not be known to the patient which is the radiation dose of exposure to the thyroid, reconstructed from the medical record. Each model accounts for competing risks of thyroid removal, other second primary cancer (SPC), and death before SPC. The models are validated using outcomes from the French/United Kingdom CCSS.

Keywords: Absolute risk; Childhood cancer survivor; Thyroid cancer; Dose-response.

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