Breast cancer following spinal radiotherapy for a childhood cancer: A report from the childhood cancer survivor study (CCSS).

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Background: Small dosimetry-based studies suggest females treated with spinal radiotherapy (RT) for a pediatric malignancy may have an increased risk of subsequent breast cancer (BC) due to scatter radiation to breast tissue. However, BC risk in this population has not been assessed in well-characterized survivor cohorts with long-term follow-up. **Methods:** In the CCSS cohort, we estimated BC incidence in 363 5-yr survivors of leukemia (n=195) and central nervous system (CNS) tumors (n=168) diagnosed 1970-86 prior to age 21 and treated with spinal RT. The median delivered dose of spinal RT for leukemia survivors was 1800 cGy (range 150-4175 cGy) and for CNS tumor survivors was 3453 cGy (range 475-6500 cGy). BC risk compared with the general population was evaluated with standardized incidence ratios (SIRs) estimated using the Surveillance, Epidemiology, and End Results (SEER) Program. Cumulative incidence was estimated treating death as a competing risk. **Results:** With a median follow-up time of 27.5 yrs (range 9-38) and a median attained age of 35 yrs (range 10-53), 3 women were diagnosed with BC at ages 31, 41 and 41 yrs. All were leukemia survivors with spinal RT doses of 1800, 2000, and 2588 cGy; none had a known family history of BC (1 was adopted). BC cumulative incidence by age 40 was 0.5% (95% confidence interval (CI) 0-2.5%). The SIR was 1.2 (95% CI 0.8-7.8) for all survivors treated with spinal RT, 3.9 (95% CI 1.3-12.1) for leukemia survivors, and 0 for CNS tumor survivors. **Conclusions:** We did not find convincing evidence that spinal RT for a childhood cancer is associated with an increased BC risk. The increased risk in leukemia survivors who were treated with lower doses of RT relative to CNS tumor survivors may be due to other factors including a genetic predisposition.