Impact of Hematopoietic Cell Transplantation with Total Body Irradiation on the Health Status of Childhood Leukemia Survivors: A Report for the Childhood Cancer Survivor Study (CCSS).

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Hematopoietic cell transplantation (HCT) using total body irradiation (TBI) continues to be an important treatment for children with recurrent/high risk acute leukemias. Previous studies in children examining the impact of TBI have been limited by small numbers and short length of follow-up. This study compares global health status in a large cohort of long-term survivors after HCT for acute leukemia (cases) that received TBI and compares them to patients treated for leukemia who did not receive HCT (controls). **Methods**: Participants were part of the CCSS, a large multi-institutional study of over 14,000 long-term survivors of childhood cancer (diagnosed <21 yr of age and treated between 1970-1986) who had survived greater than 5 years and completed a comprehensive health status questionnaire. Self-reported outcome measures included: (1) questions assessing general health, functional status (needing help with personal cares, household activities, ability to attend school or work), and limitations of activity (inability to climb stairs or walk one block), (2) the 18 item Brief Symptom Inventory (BSI) assessing mental health, and (3) specific questions about anxiety/pain related to disease or treatment and future health concerns. Data were analyzed from 207 cases treated for leukemia (152 ALL, 55 AML) who had received HCT/TBI and compared to 3508 controls treated for leukemia (3272 ALL, 236 AML) without HCT/TBI. Sixty four percent of cases and 51% of controls were male. The majority of cases and controls were Caucasian (81% and 83%). Mean age at diagnosis was 7.8 yr (SD 5.5yr, range 0-20) for cases and 5.6 yr (SD 4.4 yr, range 0-20) for controls, with a mean age at study participation of 19.4 yr (SD 6.8 yr, range 6-38) for cases and 20.3 yr (SD 6.5yr, range 6-42) for controls. **Results:** In a multivariate model (adjusting for age at interview, sex, and race), HCT/TBI cases were 2.1 times (95% confidence interval [CI] 1.3-3.5) more likely to report adverse general health, functional impairments (odds ratio [OR] 3.6, 95% CI 2.4-5.6), activity limitations (OR 4.0, 95% CI 2.9-5.5), and pain related to their cancer diagnosis or treatment (OR 3.6, 95% CI 2.3-5.8). HCT/TBI cases were not more likely than controls to report adverse mental health or anxiety related to their cancer diagnosis. Participants were also asked about health concerns and HCT/TBI cases were 1.8 times (95% CI 1.1-2.9) more likely to report concerns about future health, 2.0 times (95% CI1.4-3.0) more likely to report concerns about fertility, but were not more likely to have concerns about their ability to obtain health or life insurance. **Conclusion:** Survivors of childhood leukemia who received HCT with TBI do not report more anxiety or adverse mental health status compared to survivors treated without HCT/TBI. They do, however, report an increased adverse perception of general health, functional impairments, activity limitations, pain, and more concerns regarding their future health and fertility. HCT survivors should have ongoing long-term follow-up and be monitored closely so that appropriate interventions may be provided.