Non-neurological late effects among childhood brain tumor survivors: a preliminary analysis from the Childhood Cancer Survivors Study.

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We conducted an outcomes evaluation among 1621 brain tumor survivors who participated in the Childhood Cancer Survivors Study (CCSS). The CCSS is a multicenter, retrospective cohort study of children and adolescents who were diagnosed with a neoplasm between 1970 and 1986 and survived at least 5-years post-diagnosis. Frequency and onset of late effects were collected from a questionnaire instrument by self or surrogate report. Treatment data were collected from medical records. Rates for selected outcomes that occurred 5 or more years after diagnosis were compared with that of 3210 sibling participants who were cancer-free. After controlling for age at interview and sex in a multivariate regression analysis, survivors reported substantially higher rates than siblings for underactive thyroid (relative risk [RR] 7.0, 95% confidence interval [CI] 4.7-10.5), thyroid nodules (RR 6.1 95% CI 2.4-17.4), and thyroid removal (RR 5.1, 95% CI 1.9-15.2). Rates among survivors were also substantially elevated compared with siblings for growth hormone deficiency (RR 160, 95% CI 51-968), stroke (RR 18.2, 95% CI 7.7-53.7), osteoporosis (RR 20.3, 95% CI 7.0-85.9), and cataract surgery (RR 23.8, 95% CI 4.2-449). Rates of diabetes mellitus differed little between survivors and siblings. Among survivors, after controlling for histology, sex, age at diagnosis and age at interview, radiotherapy consistently increased risk for the above-mentioned outcomes relative to surgery alone. Risks were even higher for those who also received chemotherapy, and the increase was not due to higher radiation dose. Surprisingly, relative risks for most outcomes varied little by age at diagnosis. We found that adolescents and adults who survived brain tumors during childhood have a high risk for numerous non-neurological late effects. Primary care and oncology providers should be aware of the risk of late effects in brain tumor survivors, and encourage appropriate monitoring and follow-up treatment.