Where Have All the Fat Cells Gone? A Comparative Analysis of Adiposity Patterns in Childhood Brain Tumor Survivors and Non-Cancer Controls

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Brain tumors are the most common solid tumors in children in Canada. While technological advances have increased their survival rates, survivors of childhood brain tumors (SCBT) often develop obesity, which can reduce lifespan and quality of life. While adiposity is a known factor for cardiometabolic disorders in the general population, adiposity patterns in SCBT have not been determined. This study aims to investigate how adiposity patterns differ between SCBT and non-cancer controls, and how lifestyle and treatment factors may contribute to these patterns. Methods: Fifty-nine SCBT and 108 non-cancer controls were recruited from the clinics at McMaster Children’s Hospital. Sociodemographic and lifestyle details were collected using standardized tools to assess diet, physical activity, and sleep. Brain tumor type, location and treatment details were obtained from medical records. Total and visceral adiposity were determined by total fat mass (FM) as well as waist-to-hip (WHR) and waist-to-height ratio (WHTR). Results: SCBT have higher total and visceral adiposity, while BMI is similar to controls. Female SCBT who received radiotherapy and/or chemotherapy have higher adiposity. A dietary pattern of white bread and fried foods with low dark bread was positively associated with adiposity. Lower physical activity levels, but not sleep durations, were associated with higher adiposity. Conclusion: SCBT have higher visceral and total adiposity than non-cancer controls. Sex, chemoradiotherapy, high fat diet, and physical inactivity, can contribute to these adiposity patterns. These results provide multiple points of entry to design interventions that reduce adiposity, and may improve long-term outcomes in SCBT.

Epidemiology and Review of the Trends of Brain Tumors in Children under the Age of 3: A Report from the Canadian Pediatric Brain Tumour Consortium

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To describe the epidemiology of children under age 3 diagnosed with central nervous system tumors in Canada. Case ascertainment: Retrospective observation study of children under age 3 diagnosed with neoplasm involving the central nervous system between 1990 and 2005 at 13 of the Canadian pediatric oncology centres. Results: Case ascertainment was 573 persons. Below 6 months of age at diagnosis, no gender difference was seen and the commonest location of tumor was supratentorial. Embryonal tumors were the commonest, increased head circumference and vomiting were the commonest presenting symptom and survival rates were poor. Over 6 months of age at diagnosis, male predominance occurred and commonest location of tumor was the cerebellum. The commonest tumor was astrocytic, vomiting was the commonest presenting symptom and survival was better than in the under 6-month age group. Conclusion: Over the study period, the incidence rate and degree of resection remained stable. A trend to increased survival in children with ependymal tumors occurred; while, with medulloblastoma, survival decreased.