Cancer. 2025 Jan 15;131(2):e35673. doi: 10.1002/cncr.35673.

Impact of obesity on outcome in children diagnosed with cancer in Canada: A report from Cancer in Young People in Canada

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PMID: 39801179 DOI: 10.1002/cncr.35673

Abstract

Background: Childhood obesity can result in adverse health outcomes. The objectives of this study were to describe the prevalence of obesity and determine the association between obesity at cancer diagnosis and event-free survival (EFS) and overall survival (OS) in children diagnosed with cancer in Canada.

Methods: The authors conducted a retrospective cohort study using the Cancer in Young People in Canada database, including all children with newly diagnosed cancer aged 2-18 years across Canada from 2001 to 2020. Obesity was defined as age-adjusted and sex-adjusted body mass index greater than or equal to the 95th percentile. Univariate and multivariable Cox proportional hazards models compared EFS and OS between patients with and without obesity at diagnosis.

Results: In total, 11,291 patients were included, of whom 10.5% were obese at diagnosis. In multivariable models controlling for age, sex, ethnicity, neighborhood income quintile, treatment era, and cancer categories, obesity at diagnosis was independently associated with inferior EFS (adjusted hazard ratio [aHR], 1.16; 95% confidence interval [CI], 1.02-1.32; p = .02) and OS (aHR, 1.29; 95% CI, 1.11-1.49; p = .001). The adverse prognostic impact of obesity was particularly notable for acute lymphoblastic leukemia (ALL) and central nervous system (CNS) tumors. In children with ALL (n = 3458), obesity remained associated with inferior EFS (aHR, 1.55; p = .002) and OS (aHR, 1.75; p = .002) in multivariable analysis. In patients with CNS tumors (n = 2458), obesity was also associated with inferior EFS (aHR, 1.38; p = .008) and OS (aHR, 1.47; p = .004).

Conclusions: In this population-based study, obesity at cancer diagnosis was independently associated with inferior survival across the entire cohort, and prominently in children with ALL and CNS tumors.

Keywords: central nervous system tumors; leukemias; obesity; pediatric cancers.