Fact Sheet

Cancer in Adolescents in Canada (15-19 years)

OVERVIEW

- Each year, on average 412 adolescents are diagnosed with cancer in Canada and 74 die from the disease.[1, 2]
- Although the proportion of adolescents diagnosed with cancer is small compared to older individuals, a diagnosis of cancer during adolescence can have long-term impacts on life expectancy and quality of life.[3]
- The most common types of cancers in adolescents include lymphomas (29%), carcinomas (20%), germ cell tumours (13%), and leukemias (12%). Nine out of ten lymphoma diagnoses are represented by Hodgkin and Non-Hodgkin lymphoma, and nearly three quarters of carcinomas and other malignant epithelial neoplasms are thyroid carcinomas or malignant melanomas. Among younger children, embryonal tumours such as neuroblastoma, rhabdo-myosarcoma, Wilms tumours, hepatoblastoma, and retinoblastoma are more common. [1, 3]
- Adolescents with cancer have not demonstrated the same gains in survival experienced by younger children. It is not clear why this outcome gap exists. Lower rates of enrolment in clinical trials among the former may partially explain this phenomenon.[7]

INCIDENCE AND MORTALITY

- Between 1992 and 2007, the incidence of adolescent cancer remained stable (Figure 1) and the average age-standardised incidence rate (ASIR) was observed to be 199 cases per 1,000,000. [1]
- Differences by sex were evident. More males were diagnosed with cancer than females during this period (3530 versus 3073). Thyroid cancer was the most common cancer among females, representing 19% of all diagnoses per year. Germ cell tumours of the testis was the most common cancer among males, representing 24% of all diagnoses per year. [1]
- Overall age-standardized cancer mortality rate for adolescents declined significantly between 1992 and 2006, by 3.0% per year. For the same period, the average age-standardised mortality rate (ASMR) was observed to be 36 cases per 1,000,000. [2]
- Leukemia is the most common cause of cancer deaths in both sexes (30% in males, and 24% in females), followed by brain and nervous system cancers (15% in males and females).[2]

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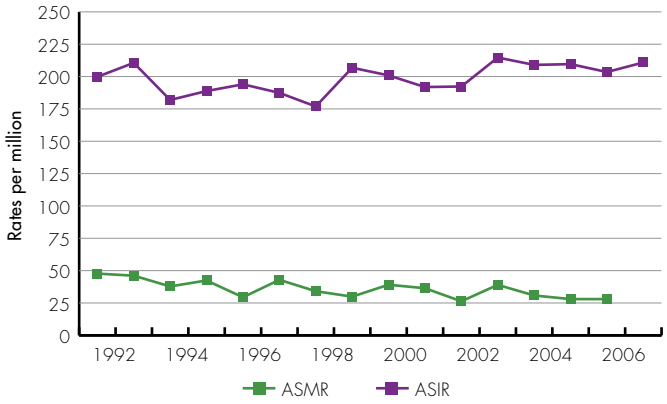
Figure 1: Age-standardised incidence rates (ASIR, 1992-2007) and age-standardised mortality rates (ASMR, 1992-2006) for all cancers among adolescents, 15-19 years, Canada



Source: The Canadian Cancer Registry and the Canadian Vital Statistics Death Database, Statistics Canada.

RISK FACTORS

- As in younger children, little is known about the causes of cancer among adolescents. While prenatal and congenital factors play a stronger role in the aetiology of cancers in younger children, environmental risk factors are more likely to be implicated in adolescent cancers. However, very few are linked to a single risk factor. Exceptions consist of carcinogens such as diethylstilbestrol, associated with vaginal or cervical adenocarcinoma, and exposure to ionizing radiation, including radiation-induced cancer therapy. Other suspected environmental carcinogens include excessive exposure to sunlight, and smoking tobacco products. Scientific evidence suggests that adolescents who develop cancer after prolonged exposure to an environmental carcinogen may have a predisposing genotype.[4, 5]

TREATMENT

- Adolescents diagnosed with cancer in Canada are commonly treated with a combination of chemotherapy, radiotherapy, and surgery.
- Approximately 30% of adolescents are treated at 17 pediatric cancer centres across the country, with variation by region, type, and age at diagnosis. The rest are treated at adult cancer centres.[6]
- There are clear advantages of being treated at a specialised pediatric cancer center. Between 1995 and 2000 adolescents treated at a pediatric cancer centre in Canada were more likely to be enrolled in a clinical trial (21% versus 0%) and have shorter wait times until treatment (92 days versus 57 days) than those treated at an adult centre. [6]
- Enrolment in clinical trials offers a survival advantage for certain pediatric cancers such as acute lymphoblastic leukemia, non-Hodgkin lymphoma, Wilms tumours, and medulloblastoma, with some emerging evidence for rhabdomyosarcoma. The secondary benefits of clinical trial participation are improved quality of life due to care from an expanded healthcare team, individualised treatment protocols, and opportunities to contribute to the care of future patients. [8]

SURVIVAL

- The latest Canadian statistics on advances in the treatment show that 85% of adolescents and young adults (15-29 years, excluding Quebec) will survive five years past their diagnosis. Some cancers in this age group have better prognosis than others. Among common cancers, the highest five-year survival proportions were observed for thyroid (99%), testis (96%), Hodgkin lymphoma (95%), and melanoma (93%), while the lowest were seen for leukemias (68%) and brain tumours (68%).[11]
- Treatment and care for adolescents remains a challenge due to low participation in clinical trials, the type of tumours in this age group, patterns of care, and the lack of specialised cancer care centres for adolescents in Canada.[6-8]

LATE EFFECTS

- Although children and adolescents are more likely to survive cancer when compared to adults, due to the adverse effects of cancer treatments they receive, approximately two-thirds experience poor health outcomes later in life known as late effects.
- Some of these adverse effects of treatment include cardiopulmonary, endocrine, renal or hepatic dysfunctions; female infertility; male gonadal toxicity; neurocognitive impairment; psychosocial difficulties and the development of subsequent cancers. [3, 9]
- The complexity of psychosocial and educational needs in adolescent survivors of cancers is addressed in a few Canadian pediatric cancer centres. The rarity of the conditions and the lack of research into the unique needs faced by survivors make it difficult to offer long-term survivorship care.[3, 9]

SURVEILLANCE

Formerly known as the Canadian Childhood Cancer Surveillance and Control Program, the Cancer in Young People in Canada Program (CYP-C) aims to fill gaps in knowledge and ultimately reduce the burden of childhood cancer in Canada. CYP-C is a partnership between the Public Health Agency of Canada and the C[17] Council, a network of all the seventeen pediatric cancer centers across the country. For more information, please contact the manager of the CYP-C program at *cypc-ccjc@phac-aspc.gc.ca*.[10]

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