Health Reports: Increasing survival from leukemia among adolescents and adults in Canada: A closer look

Released at 8:30 a.m. Eastern time in The Daily, Wednesday, July 20, 2016

Five-year relative survival ratios (RSRs) for adolescents and adults diagnosed with leukemia in Canada improved more than the ratio for almost any other type of cancer from 1992 to 2008. A new study shows that the increase in survival varied depending on the type of leukemia.

Foreign population-based studies—often from the United States or Sweden—have found that improvements in survival vary by the type of leukemia and by the age at onset within specific leukemia types. The new study uses data from the Canadian Cancer Registry to get a clearer picture of the increase in survival in Canada. This includes breaking down the survival estimates by both the sex of the patient and age at diagnosis.

Chronic lymphocytic accounts for more than 4 in 10 new cases of leukemia

Leukemia accounts for 3% of all new primary cancers each year in Canada. Over the 1992-to-2008 period, the type of leukemia most commonly diagnosed among adolescents and adults was chronic lymphocytic (44.1% of cases), followed by acute myeloid (24.3%), chronic myeloid (12.3%) and acute lymphocytic (4.6%).

Survival gains greatest for chronic myeloid leukemia

Five-year RSRs improved significantly for all four main types of leukemia. The biggest gain was observed for chronic myeloid, which increased 24.9 percentage points from 36.0% in 1992 to 1994 to 60.9% by the end of the study period in 2006 to 2008. Acute lymphocytic leukemia was associated with the next biggest gain, rising from 26.3% to 43.1%. For all leukemias combined, survival increased from 45.7% to 57.5%, an 11.8 percentage point increase.

A wide variation in five-year survival rates among the main leukemia types persisted throughout the study period. Chronic lymphocytic continued to have the highest RSRs, rising from 68.6% to 80.9%. Acute myeloid continued to have the lowest survival, increasing from 13.6% to 22.8%—the smallest improvement of the main types.

Gains in survival for the main types of leukemia have been attributed to a variety of factors. These include increasing use of targeted therapies, intensified chemotherapy, improvements in stem cell transplantation techniques and the introduction of pediatric-inspired protocols in young adults. As well, improvements have been ascribed to a better understanding of how to diagnose and allocate individuals into different treatments, and better and greater use of supportive care.

Increases for both men and women

Over the study period, men accounted for more than half of all cases of leukemia diagnosed among adolescents and adults, ranging from 54.1% of all acute myeloid cases to 60.3% of chronic lymphocytic cases and about the same level for the other two varieties.

RSRs for each type of leukemia rose significantly for both men and women. Increases were once again highest for chronic myeloid, where five-year survival increased from 35.1% to 64.9% for women and from 36.2% to 57.7% for men. For both sexes, the smallest increases were for acute myeloid.

The study also found a significant survival advantage for women relative to men for all leukemias combined. Among individual types, the survival advantage for women was also observed for chronic myeloid and chronic lymphocytic leukemia.

Age at diagnosis found to be a factor

Chronic lymphocytic leukemia was much more likely to be diagnosed at older ages, and was rarely detected at ages 15 to 44 (2.5% of all cases between the ages of 15 and 99). In contrast, almost half (48.8%) of non-childhood acute lymphocytic cases were diagnosed before the age of 45.

The substantial gains in survival associated with chronic myeloid leukemia were evident in each of the five age groups considered. In particular, five-year survival increased from 46.1% to 87.5% among people diagnosed at ages 45 to 54. For chronic lymphocytic, improvements in survival were greatest at age 65 or older. In contrast, for acute myeloid, the largest improvements—just over 20 percentage points—were found among people in the 15-to-44 and 45-to-54 age groups, while survival remained below 5% among those aged 75 to 99.

For both types of acute leukemia, five-year survival estimates for 2006 to 2008 were highest among people diagnosed at ages 15 to 44, at just over 60.0%. However, these estimates declined sharply with age. For the chronic types of leukemia, survival estimates also declined with age at diagnosis, but the starting points were much higher. For the 15-to-44 age group, the initial figures were 94.1% for chronic lymphocytic leukemia, and 86.5% for chronic myeloid. As well, survival did not begin to diminish until after the age of 54.

Note to readers

Cancer incidence data are from the October 2011 version of the Canadian Cancer Registry, with mortality follow-up to December 31, 2008 through record linkage to the Canadian Vital Statistics Death Database and from information reported by the provincial/territorial cancer registries. Analyses were based on all primary leukemias. Data from the province of Quebec were excluded because of issues in correctly ascertaining the vital status of cases and because the method of determining the date of diagnosis differed from that of the other jurisdictions.

Survival estimates are based on people aged 15 to 99 at diagnosis and are standardized by either age, case-mix, or age and case-mix simultaneously as appropriate. Survival was calculated using relative survival methodology and estimates implicitly measure net survival—the survival probability that would be observed in the hypothetical situation where the cancer of interest is the only possible cause of death. It measures the excess mortality that may be attributed to the diagnosis (higher survival means less excess mortality).

Definitions, data sources and methods: survey number 3207.

"Increasing survival from leukemia among adults in Canada: A closer look" is available in the July 2016 online issue of *Health Reports*, Vol. 27, No. 7 (**82-003-X**) from the *Browse by key resource* module of our website, under *Publications*.

This issue of *Health Reports* contains two other articles: "Socioeconomic differences in nitrogen dioxide ambient air pollution exposure among children in the three largest Canadian cities" and "The influence of community well-being on mortality among Registered First Nations people."

For more information, contact us (toll-free 1-800-263-1136; 514-283-8300; **STATCAN.infostats-infostats.STATCAN@canada.ca**).

To enquire about the concepts, methods or data quality of this release, contact Larry F. Ellison (**larry.ellison@canada.ca**), Health Statistics Division.

For more information on the article, "Socioeconomic differences in nitrogen dioxide ambient air pollution exposure among children in the three largest Canadian cities," contact Lauren Pinault (**lauren.pinault@canada.ca**), Health Analysis Division.

For more information on the article, "The influence of community well-being on mortality among Registered First Nations people," contact Lisa N. Oliver (**lisa.oliver@canada.ca**), Research Data Centre Program.

For more information about *Health Reports*, contact Janice Felman (613-799-7746; **janice.felman@canada.ca**), Health Analysis Division.