Long-term outcomes in survivors of neuroblastoma: a report from the Childhood Cancer Survivor Study

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Abstract

Background: The 5-year survival rate for individuals with neuroblastoma (NB) is approaching 70%. Few data exist, however, on long-term outcomes of these patients, who are often treated at a very young age.

Methods: Outcome data from 954 5-year NB survivors diagnosed between 1970-1986 and enrolled in the Childhood Cancer Survivor Study (CCSS) were obtained. Late mortality, second malignant neoplasms (SMN) and chronic health conditions were analyzed in relation to treatment factors. NB survivors were compared to a cohort of 3899 siblings of CCSS participants for risk for chronic health conditions and selected sociodemographic outcomes.

Results: Seventy percent of patients were free of disease for more than 10 years after diagnosis (defined as survivors with no detectable disease at least 10 years after diagnosis). The long-term survivors had a higher risk of SMN (odds ratio [OR] per year of follow-up: 0.99, 95% confidence interval [CI]: 0.98-1.00) and chronic health conditions (OR = 1.24, 95% CI: 1.20-1.28) compared to the sibling cohort. The risk of SMN was lower among late survivors (OR = 0.85, 95% CI: 0.76-0.95) compared to early survivors (OR = 1.41, 95% CI: 1.31-1.52). The risk of chronic health conditions was higher among late survivors (OR = 1.36, 95% CI: 1.28-1.45) compared to early survivors (OR = 1.18, 95% CI: 1.14-1.22).

Objective 1: To investigate the occurrence of, and risk factors for, selected long-term outcomes.

Objective 2: To analyze late mortality, second malignant neoplasms (SMN) and chronic health conditions in relation to treatment factors.

Objective 3: To compare the risk for NB survivors of developing selected chronic health conditions and sociodemographic outcomes relative to siblings.

Methods

CCSS cohort of 5-year NB survivors diagnosed between 1970-1986 (n = 954) and baseline questionnaire and follow-up surveys (2000 and 2002).

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Medical information abstracted from medical records and cumulative doses, surgical procedures, radiographic therapy data.

Comparison of group of siblings of cancer survivors (n = 3899)

Introduction


Therapy for low and intermediate risk NB has become less intensive.

High-risk patients continue to fare poorly despite the use of multimodal intensive therapy.

NB survivors (vascular malformations) have been less extensively studied even though they are among the youngest treated and potentially most vulnerable patients.

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Conclusions

NB survivors are at elevated risk for early mortality, SMN and chronic health conditions (musculo-skeletal, neurological, endocrine complications and hearing loss).

NB survivors have less favorable sociodemographic outcomes compared to siblings.

Long-term medical surveillance is required for early detection of medical complications in NB survivors.