Original Article

Second Malignant Neoplasms in Childhood Cancer Survivors Treated in a Tertiary Paediatric Oncology Centre

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Abstract

Introduction: One of the most feared complications of childhood cancer treatment is second malignant neoplasms (SMNs). This study evaluates the incidence, risk factors and outcomes of SMNs in a tertiary paediatric oncology centre in Singapore. Materials and Methods: A retrospective review was conducted on patients diagnosed with childhood cancer under age 21 and treated at the National University Hospital, Singapore, from January 1990 to 15 April 2012. Case records of patients with SMNs were reviewed. Results: We identified 1124 cases of childhood cancers with a median follow-up of 3.49 (0 to 24.06) years. The most common primary malignancies were leukaemia (47.1%), central nervous system tumours (11.7%) and lymphoma (9.8%). Fifteen cases developed SMNs, most commonly acute myeloid leukaemia/myelodysplastic syndrome (n = 7). Median interval between the first and second malignancy was 3.41 (0.24 to 18.30) years. Overall 20-year cumulative incidence of SMNs was 5.3% (95% CI, 0.2% to 10.4%). The 15-year cumulative incidence of SMNs following acute lymphoblastic leukaemia was 4.4% (95% CI, 0% to 8.9%), significantly lower than the risk after osteosarcoma of 14.2% (95% CI, 0.7% to 27.7%) within 5 years (P <0.0005). Overall 5-year survival for SMNs was lower than that of primary malignancies. Conclusion: This study identified factors explaining the epidemiology of SMNs described, and found topoisomerase II inhibitor use to be a likely risk factor in our cohort. Modifications have already been made to our existing therapeutic protocols in osteosarcoma treatment. We also recognised the importance of other risk management strategies, including regular long-term surveillance and early intervention for detected SMNs, to improve outcomes of high risk patients.

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