

The changing epidemiology of paediatric brain tumours: a review from the Hospital for Sick Children

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Abstract

Purpose This study examines the changing epidemiology of paediatric brain tumours over the past three decades (1980–2008) in a single institution, SickKids, Toronto, Canada.

Methods We classified 1,866 surgical pathology cases of brain tumours in children under the age of 19 according to the World Health Organization 2007 consensus and analysed them by gender, histological tumour type, age distribution and decade.

Results Males showed a slightly higher predominance with 56.8% of cases overall. The main histological tumour types were low-grade (I/II) astrocytomas (26.4%), medulloblastoma (10.6%), anaplastic astrocytoma/glioblastoma multiforme (7.1%) and ependymoma (7.0%). Over three decades, an increasing proportion of certain tumour types, including pilocytic astrocytoma, atypical teratoma/rhabdoid tumours and neuronal/mixed neuronal-glioma tumours was seen.

Conclusions Our results are consistent with those published with similar methodologies in other countries. Any changes in the epidemiology of childhood central nervous system tumours over the past three decades may be attributed in part to changing classification systems, improved imaging technologies and developments in epilepsy surgery; however, continued surveillance remains important.

Keywords Paediatric brain tumours · Epidemiology · Central nervous system · WHO classification

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Introduction

Cancer in children over the age of 1 month remains the leading cause of disease-related death in Canada [8]. After haematologic malignancies, central nervous system (CNS) tumours are the most common group of childhood cancers, accounting for approximately 20% of new childhood cancer cases in Canada from 2000–2004 [8].

The epidemiology of childhood cancer can be considered in the context of trends in incidence and projection for the future. Several agencies and institutions throughout the world have been monitoring these trends over the past three decades. This includes regional agencies such as the Pediatric Oncology Group of Ontario (POGO); national agencies such as the National Cancer Institute of Canada (NCIC); the Central Brain Tumour Registry of the USA (CBTRUS); the Surveillance, Epidemiology and End Results (SEER) Program of the National Cancer Institute and international agencies such as the International Agency for Research on Cancer and the World Health Organization (WHO). The public health consequences, particularly as they relate to the health, social, economical and emotional effects on children and their families affected by cancer, continue to justify worldwide surveillance [4, 8]. Knowledge in this area can direct further initiatives in research, surveillance, prevention, possible screening, diagnosis, treatment and follow up. The changing epidemiology over the past three decades may be a reflection of potential environmental factors and the impact that public health initiatives and advances in health care have made on the burden of childhood CNS cancer.

We have examined the pathological composition of CNS tumours in patients under 19 years of age seen at our institution, the Hospital for Sick Children (SickKids), in Toronto, Ontario. A comparison between the histological