Cognitive Impairment Subsequent to Successful Pediatric Brain Tumour Treatment
The Long-term Implications

Abstract

PEDIATRIC BRAIN TUMORS

Locations of various common pediatric central nervous system tumors:

Primary brain tumors are a diverse group of intracranially-originating neoplasms that account for the most solid cancer deaths among children under the age of 20 (Brain Tumor Foundation Of Canada, 2015). In the past 30 years, the survival rate from childhood brain tumors has greatly increased thanks to improved surgical, chemotherapeutic, and radiation therapy (Duffett, 2010). For this reason, increased emphasis is now being placed on the quality of life (QOL) of children who are cured of their brain tumors. Such long-term outcomes are important for facilitating an improved understanding of the effects of childhood brain tumors on the developing brain and for the education of parents and caregivers (Gill, Keiffer, & Kalifa, 2004). Survivors, due to their varying degrees of physical and cognitive disabilities, require extensive rehabilitation and social support (Torr and Olson, 2010). What is the nature and extent of the long-term cognitive disabilities experienced by individuals who undergo successful treatment for brain tumours? 20 years later the literature on this topic is quite ambiguous. What is the nature and progression of these cognitive deficiencies? Additional information was also collected pertaining to the predictors and risk factors for increased cognitive decline, following treatment.

Research Question

What is the nature and extent of the long-term cognitive deficiencies experienced by individuals who undergo successful treatment for common pediatric brain tumours?

Methods

Cross-sectional retrospective case series.

Sample

Pediatric brain tumour survivors who were treated and are free of recurrent malignancies, they may not be able to maintain the same quality of life that they could have expected before their treatment.

Inclusion criteria:

Survivors of pediatric brain tumors.

Confounders:

Experimental Neuropsychology, 16


Meta-analysis (Robinson et al.,2010):... 3. cognitive processing speed, and 4. general executive functioning.

Results

The selective attrition of participants due to progressive disease and death was considered a methodological limitation of this study. The outcomes of this study do not necessarily translate to the large population of pediatric brain tumour survivors. The sample size of the present study is small, which may limit the generalizability of the findings.

Conclusion

Cognitive and neuropsychological impairments experienced post-treatment by pediatric brain tumour survivors almost always manifest themselves as difficulties with sustained attention, and often as limitations in short-term or working memory, a slower cognitive processing speed, and deficits in executive functioning. These impairments are multifaceted and are influenced by a variety of factors, such as the type of tumour, the treatment received, and the individual's characteristics. The impact of these impairments on cognitive functioning may progress over periods of time as long as 10 years depending on the cognitive domain in question, but strong conclusions based on study results could not be made in this regard.