Long-term cognitive sequelae after pediatric brain tumor related to medical risk factors, age, and sex.

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Abstract

BACKGROUND: Young age at diagnosis and treatment with cranial radiation therapy are well studied risk factors for cognitive impairment in pediatric brain tumor survivors. Other risk factors are hydrocephalus, surgery complications, and treatment with intrathecal chemotherapy. Female gender vulnerability to cognitive sequelae after cancer treatment has been evident in some studies, but no earlier studies have related this to tumor size. The purpose of our study was to find factors correlated with lowered IQ in a nationally representative sample of pediatric brain tumor patients referred for neuropsychologic evaluation.

METHODS: Sixty-nine pediatric brain tumor patients, diagnosed 1988-2005 and tested 1995-2006, were included in the study. In a series of stepwise multiple regressions, the relationship of IQ to disease, treatment, and individual variables (sex and syndromes) were evaluated. A subanalysis was made of the covariation between sex and tumor size.

RESULTS: The patients had generally suppressed IQ and impairments in executive function, memory, and attention. Lowered IQ was associated with young age at diagnosis, being male, tumor size, and treatment with whole-brain radiation therapy. A sex difference was evident for patients with increased intracranial pressure at diagnosis with males having larger tumors. Tumor size was found to be a better predictor of cognitive sequelae than sex.

CONCLUSIONS: Whole-brain radiation therapy, large tumors, young age at diagnosis, and male gender are risk factors for late cognitive sequelae after pediatric brain tumors. When examining sex differences, tumor size at diagnosis needs to be taken into account.

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KEYWORDS: cognition; pediatric brain tumor; sex; whole-brain radiation therapy

PMID: 25266614 [PubMed - in process]
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