Early Clinical Outcomes Demonstrate Preserved Cognitive Function in Children with Average-Risk Medulloblastoma When Treated with Hyperfractionated Radiation Therapy.

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Abstract

PURPOSE: To report on acute toxicity, longitudinal cognitive function, and early clinical outcomes in children with average-risk medulloblastoma.

METHODS AND MATERIALS: Twenty children ≥5 years of age classified as having average-risk medulloblastoma were accrued on a prospective protocol of hyperfractionated radiation therapy (HFRT) alone. Radiotherapy was delivered with two daily fractions (1 Gy/fraction, 6 to 8 hours apart, 5 days/week), initially to the neuraxis (36 Gy/36 fractions), followed by conformal tumor bed boost (32 Gy/32 fractions) for a total tumor bed dose of 68 Gy/68 fractions over 6 to 7 weeks. Cognitive function was prospectively assessed longitudinally (pretreatment and at specified posttreatment follow-up visits) with the Wechsler Intelligence Scale for Children to give verbal quotient, performance quotient, and full-scale intelligence quotient (FSIQ).

RESULTS: The median age of the study cohort was 8 years (range, 5-14 years), representing a slightly older cohort. Acute hematologic toxicity was mild and self-limiting. Eight (40%) children had subnormal intelligence (FSIQ <85), including 3 (15%) with mild mental retardation (FSIQ 56-70) even before radiotherapy. Cognitive functioning for all tested domains was preserved in children evaluable at 3 months, 1 year, and 2 years after completion of HFRT, with no significant decline over time. Age at diagnosis or baseline FSIQ did not have a significant impact on longitudinal cognitive function. At a median follow-up time of 33 months (range, 16-58 months), 3 patients had died (2 of relapse and 1 of accidental burns), resulting in 3-year relapse-free survival and overall survival of 83.5% and 83.2%, respectively.

CONCLUSION: HFRT without upfront chemotherapy has an acceptable acute toxicity profile, without an unduly increased risk of relapse, with preserved cognitive functioning in children with average-risk medulloblastoma.

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