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Radiation Therapy to the Whole Brain and Spine, Followed by an Extra Dose of Radiation to the Back of the Brain

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Abstract

Medulloblastoma is a rare but devastating brain cancer in children. The cancer can spread through the spinal fluid and deposit elsewhere in the brain or spine. Radiation therapy to the whole brain and spine, followed by an extra dose of radiation to the back of the brain, prevented this spread and became the standard of care. However, radiation used to treat such tumors causes damage to the brain and impairs cognitive function. It affects, especially in young patients whose brains are growing.

Keywords: Cancer; Cells; Tissues; Tumors; Prevention; Prognosis; Diagnosis; Imaging; Screening, Treatment; Management

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Introduction

Children with moderate-risk medulloblastoma may receive a lower-volume "amplification" of radiation at the end. A six-week course of radiation therapy maintains disease control in people who receive radiation over a wider area,

but the researchers found that the dose of preventive radiation therapy given to the entire brain and spine over six weeks could not be sustained without reduced survival. Decrease. In addition, researchers have shown that cancer patients respond differently to treatment depending on the biology of the tumors, paving the way for future clinical trials for more



targeted therapies. In children with medulloblastoma, the average five-year survival risk is 75 to 90 percent. In contrast, children with what is called "high-risk medulloblastoma" have a five-year survival rate of 50% to 75%. Other factors, such as the child's age and the extent to which the tumor has spread, help determine the risk group. For this study, researchers focused on patients with moderate-risk medulloblastoma. Medulloblastoma is a devastating disease. It is a malignant brain tumor that develops in the cerebellum, the lower back of the brain that is important for coordination of movement, speech and balance. Radiation therapy for this tumor can also be challenging, especially in younger children whose brains are active, in which case there is a balance between effective tumor treatment without compromising children's ability to move, think and learn. Children at moderate risk for medulloblastoma usually undergo surgery to remove the tumor as much as possible. They also receive chemotherapy and radiation therapy to prevent the tumor from spreading to other parts of the brain and spine through the cerebrospinal fluid [1-567].

Results and Discussion

We wanted to see if we could confidently reduce the amount of radiation in these patients. This reduces the normal parts of the brain and reduces side effects for children with this type of brain cancer, while maintaining effective treatment. We found that we could safely reduce the size of the brain that receives more radiation at the end. We hope that such measures can help reduce the side effects of this treatment, especially in young patients. In collaboration with children's hospitals across the United States and internationally, researchers evaluated 464 patients with moderate-risk medulloblastoma between the ages of 3 and 21 years. Elderly patients received all standard doses because their brain development was not vulnerable to radiation. In addition, at the end of six weeks of treatment, all patients were randomly assigned two

different doses of radiation "amplification". Patients who received less boost volume had a chance of surviving up to 82.5% and their disease did not get worse. In younger children, however, lower doses of radiation over six weeks did not result in a similar survival rate. From those who received standard doses of spinal cord radiation; About 83% survived five years and did not see a recurrence. This difference in survival was statistically significant.

Conclusions

We observed a higher rate of tumor recurrence and spread in young patients who received lower doses of spinal cord radiation therapy. It is generally not safe to reduce the radiation dose in children with medulloblastoma even if we know that low doses may reduce their cognitive function, so we are only conducting studies with these specific patients to see if we can safely reduce the radiation dose for Reduce them or not. The results of this study will play an important role in designing the next generation of clinical trials for children with medulloblastoma.

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