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Amifostine Protects Against Cisplatin-Induced Ototoxicity in Children With Average-Risk Medulloblastoma

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Purpose: To determine the role of amifostine as a protectant against cisplatin-induced ototoxicity in patients with average-risk (AR) medulloblastoma treated with craniospinal radiotherapy and four cycles of cisplatin-based, dose-intense chemotherapy and stem-cell rescue.

Patients and Methods: The primary objective was to determine whether, in patients with AR medulloblastoma (n = 62), amifostine would decrease the need for hearing aids (defined as $\geq$ grade 3 ototoxicity in one ear) compared with a control group (n = 35), 1 year from initiating treatment. Ninety-seven patients received craniospinal irradiation (23.4 Gy) followed by 55.8 Gy to the primary tumor bed using three-dimensional conformal technique, and four cycles of high-dose cyclophosphamide (4,000 mg/m^2/cycle), cisplatin (75 mg/m^2/cycle), and vincristine (two 1.5 mg/m^2 doses/cycle) and stem-cell rescue. When used, amifostine (600 mg/m^2/dose) was administered as a bolus immediately before and 3 hours into the cisplatin infusion.

Results: The median age of the 97 patients was 8.7 years (range, 3.2 to 20.2 years). The study and control groups were similar in age and sex distribution. Amifostine was well-tolerated. One year after treatment initiation, 13 patients (37.1%) in the control group versus nine (14.5%; one-sided X^2 test P = .005) of the amifostine-treated patients had at least grade 3 ototoxicity, requiring hearing aid in at least one ear.

Conclusion: Amifostine administered before and during the cisplatin infusion can significantly reduce the risk of severe ototoxicity in patients with AR medulloblastoma receiving dose-intense chemotherapy.

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Authors' disclosures of potential conflicts of interest and author contributions are found at the end of this article.