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Efficacy and safety of bevacizumab, irinotecan, and temozolomide combination for relapsed or refractory pediatric central nervous system embryonal tumor: a single-institution study

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Abstract

Objective: This study aimed to evaluate the efficacy and safety of combination therapy with bevacizumab (Bev), irinotecan (CPT-11), and temozolomide (TMZ) in children with central nervous system (CNS) embryonal tumor relapse.

Methods: The authors retrospectively examined 13 consecutive pediatric patients with relapsed or refractory CNS embryonal tumors who received combination therapy comprising Bev, CPT-11, and TMZ. Specifically, 9 patients had medulloblastoma, 3 had atypical teratoid/rhabdoid tumor (AT/RT), and 1 had CNS embryonal tumor with rhabdoid features. Of the 9 medulloblastoma cases, 2 were categorized in the Sonic hedgehog subgroup and 6 in molecular subgroup 3 for medulloblastoma.

Results: The complete and partial objective response rates were 66.6% in patients with medulloblastoma and 75.0% in patients with AT/RT or CNS embryonal tumors with rhabdoid features. Furthermore, the 12- and 24-month progression-free survival rates were 69.2% and 51.9% for all patients with recurrent or refractory CNS embryonal tumors, respectively. In contrast, the 12- and 24-month overall survival rates were 67.1% and 58.7%, respectively, for all patients with relapsed or refractory CNS embryonal tumors. The authors observed grade 3 neutropenia, thrombocytopenia, proteinuria, hypertension, diarrhea, and constipation in 23.1%, 7.7%, 23.1%, 7.7%, 7.7%, and 7.7% of patients, respectively. Furthermore, grade 4 neutropenia was observed in 7.1% of patients. Nonhematological adverse effects, such as nausea and constipation, were mild and controlled with standard antiemetics.

Conclusions: This study demonstrated favorable survival outcomes in patients with relapsed or

refractory pediatric CNS embryonal tumors and thus helped to investigate the efficacy of combination therapy comprising Bev, CPT-11, and TMZ. Moreover, combination chemotherapy had high objective response rates, and all adverse events were tolerable. To date, data supporting the efficacy and safety of this regimen in the relapsed or refractory AT/RT population are limited. These findings suggest the potential efficacy and safety of combination chemotherapy in patients with relapsed or refractory pediatric CNS embryonal tumors.

Keywords: atypical teratoid/rhabdoid tumors; bevacizumab; irinotecan; medulloblastomas; oncology; pediatric central nervous system embryonal tumor relapse; temozolomide; tumor.

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