

Clinical Cancer Research

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Cancer Therapy: Clinical

Postoperative Adjuvant Dendritic Cell-Based Immunotherapy in Patients with Relapsed Glioblastoma Multiforme

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Purpose: To investigate the therapeutic role of adjuvant vaccination with autologous mature dendritic cells (DC) loaded with tumor lysates derived from autologous, resected glioblastoma multiforme (GBM) at time of relapse.

Experimental Design: Fifty-six patients with relapsed GBM (WHO grade IV) were treated with at

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least three vaccinations. Children and adults were treated similarly in three consecutive cohorts, with progressively shorter vaccination intervals per cohort. Feasibility and toxicity were assessed as well as effect of age, extent of resection, Karnofsky Performance Score, and treatment cohort on the progression-free (PFS) and overall survival (OS) using univariable and multivariable analysis.

Results: Since the prevaccine reoperation, the median PFS and OS of the total group was 3 and 9.6 months, respectively, with a 2-year OS of 14.8%. Total resection was a predictor for better PFS both in univariable analysis *and* after correction for the other covariates. For OS, younger age and total resection were predictors of a better outcome in univariable analysis but not in multivariable analysis. A trend to improved PFS was observed in favor of the faster DC vaccination schedule with tumor lysate boosting. Vaccine-related edema in one patient with gross residual disease before vaccination was the only serious adverse event.

Conclusion: Adjuvant DC-based immunotherapy for patients with relapsed GBM is safe and can induce long-term survival. A trend to PFS improvement was shown in the faster vaccination schedule. The importance of age and a minimal residual disease status at the start of the vaccination is underscored.

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