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Therapeutic cell-based vaccines for glioblastoma multiforme

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Abstract

Glioblastoma multiforme (GBM), a highly aggressive tumor, poses significant challenges in achieving successful treatment outcomes. Conventional therapeutic modalities including surgery, radiation, and chemotherapy have demonstrated limited efficacy, primarily attributed to the complexities associated with drug delivery to the tumor site and tumor heterogeneity. To address this critical need for innovative therapies, the potential of cancer vaccines utilizing tumor cells and dendritic cells has been explored for GBM treatment. This article provides a comprehensive review of therapeutic vaccinations employing cell-based vaccine strategies for the management of GBM. A meticulous evaluation of 45 clinical trials involving more than 1500 participants revealed that cell-based vaccinations have exhibited favorable safety profiles with minimal toxicity. Moreover, these vaccines have demonstrated modest improvements in overall survival and progression-free survival among patients. However, certain limitations still persist. Notably, there is a need for advancements in the development of potent antigens to evoke immune responses, as well as the optimization of dosage regimens. Consequently, while cell-based vaccinations show promise as a potential therapeutic approach for GBM, further research is imperative to overcome the current limitations. The ultimate objective is to surmount these obstacles and establish cell-based vaccinations as a standard therapeutic modality for GBM.

Keywords: Dendritic cell; Glioblastoma; Immunotherapy; Tumor cell vaccine; Vaccine.

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