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Immunotherapy for glioma: getting closer to the clinical arena?

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Abstract

PURPOSE OF REVIEW: During recent years different approaches have been explored to raise effective antitumor responses against brain tumors and particularly glioblastomas (GBMs). In most cases, cancer vaccines were based on autologous dendritic cells loaded with GBM peptides or whole tumor lysates. Many phase I-II studies showed that such strategy is feasible and nontoxic but failed to provide convincing evidence of its efficacy. This was due to study design and other biological issues: local immune suppression and insufficient characterization of appropriate epitopes appear as particularly relevant.

RECENT FINDINGS: In neuro-oncology intriguing data have been obtained by vaccinating patients with the epidermal growth factor receptor variant III (EGFRvIII) peptide, reproducing a specific epitope arising because of large deletion of the EGFR gene. In other cancers immunotherapy is obtaining clinically meaningful results: in prostate cancer vaccination with dendritic cells loaded with a cancer peptide, and in metastatic melanoma antibodies against an immune gate-keeper, CTL4, both led to increased survival and have been approved by FDA.

SUMMARY: On the basis of these and other clinical and preclinical findings it appears that several approaches may have chances of clinical success. They include combinatorial treatments of chemotherapy and immunotherapy, systemic and local immunotherapy, vaccination against specific targets, for example cytomegalovirus protein or stem cell markers re-expressed during brain cancer progression.

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