Review

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A systematic review of immunotherapy in highgrade glioma: learning from the past to shape future perspectives

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Abstract

High-grade gliomas (HGGs) constitute the most common malignant primary brain tumor with a poor prognosis despite the standard multimodal therapy. In recent years, immunotherapy has changed the prognosis of many cancers, increasing the hope for HGG therapy. We conducted a comprehensive search on PubMed, Scopus, Embase, and Web of Science databases to include relevant studies. This study was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines. Fifty-two papers were finally included (44 phase II and eight phase III clinical trials) and further divided into four different subgroups: 14 peptide vaccine trials, 15 dendritic cell vaccination (DCV) trials, six immune checkpoint inhibitor (ICI) trials, and 17 miscellaneous group trials that included both "active" and "passive" immunotherapies. In the last decade, immunotherapy created great hope to increase the survival of patients affected by HGGs; however, it has yielded mostly dismal results in the setting of phase III clinical trials. An in-depth analysis of these clinical results provides clues about common patterns that have led to failures at the clinical level and helps shape the perspective for the next generation of immunotherapies in neuro-oncology.

Keywords: Cancer vaccines; Dendritic cell vaccination; Glioblastoma; Immune checkpoint inhibitors; Immunotherapy; Neuro-oncology.

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