ABSTRACT

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Gene therapy for high grade glioma: the clinical experience.

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INTRODUCTION: : High-grade gliomas (HGG) are the most common malignant primary brain tumors in adults, with a median survival of ~18 months. The standard of care (SOC) is maximal safe surgical resection, and radiation therapy with concurrent and adjuvant temozolomide. This protocol remains unchanged since 2005, even though HGG median survival has marginally improved.

AREAS COVERED: Gene therapy was developed as a promising approach to treat HGG. Here we review completed and ongoing clinical trials employing viral and non-viral vectors for adult and pediatric HGG, as well as the key supporting preclinical data.

EXPERT OPINION: These therapies have proven safe, and pre- and post-treatment tissue analyses demonstrated tumor cell lysis, increased immune cell infiltration, and increased systemic immune function. Although viral therapy in clinical trials has not yet significantly extended survival of HGG, promising strategies are being tested. Oncolytic HSV vectors have shown promising results both for adult and pediatric HGG. A recently published study demonstrated that HG47Δ improved survival in recurrent HGG. Likewise, PVSRIPO has shown survival improvement compared to historical controls. It is likely that further analysis of these trials will stimulate the development of new administration protocols, and new therapeutic combinations which will improve HGG prognosis.

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