ABSTRACT

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Management of newly diagnosed glioblastoma multiforme: current state of the art and emerging therapeutic approaches.

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Glioblastoma multiforme represent > 50% of primary gliomas and have five year survival rates of ~ 5%. Maximal safe surgical resection followed by radiotherapy with concurrent and adjuvant temozolomide remains the standard treatment since published by Stupp et al. (in N Engl J Med 352:987-996, 2005), with additional benefit for patients with MGMT-methylated tumors. We review the current treatment landscape and ongoing efforts to improve these outcomes. An extensive literature search of Pubmed and Google Scholar involving the search terms "glioblastoma," "glioblastoma multiforme," or "GBM" for papers published to July 2021 was conducted and papers evaluated for relevance. As well as current data that informs clinical practice, we review ongoing clinical research in both newly diagnosed and recurrent settings that provides hope for a breakthrough. The Stupp protocol remains standard of care in 2021. Addition of tumor treating fields improved mOS modestly, with benefit seen in MGMT-methylated and unmethylated cohorts and also improved time to cognitive decline but has not been widely adopted. The addition of lomustine to temozolomide, in MGMT-methylated patients, also showed a mOS benefit but further investigation is required. Other promising therapeutic strategies including anti-angiogenic therapy, targeted therapy, and immunotherapy have yet to show a survival advantage. Improvements in the multidisciplinary management, surgical techniques and equipment, early palliative care, carrier support, and psychological support may be responsible for improving survival over time. Despite promising preclinical rationale, immunotherapy and targeted therapy are struggling to impact survival. A number of ongoing clinical trials provide hope for a breakthrough.

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