

DCvax: A promising advancement in oncology for the treatment of glioblastoma

Rare Tumors
Volume 15: 1–2
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DOI: 10.1177/20363613231179541
journals.sagepub.com/home/rtu


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Keywords

Glioblastoma, DCVax, Primary Brain Tumor

Date received: 12 April 2023; accepted: 16 May 2023

Dear Editor,

Glioblastoma is a malignant neoplasm of the central nervous system that arises from glial cells, primarily astrocytes and is characterized by poorly differentiated, fusiform, round or pleomorphic astrocytic cells with marked nuclear atypical and brisk mitotic activity.¹

Despite advances in early diagnosis and comprehensive treatments, there is nearly 100% recurrence rate and dismal patient survival.² According to researchers, more than 13,000 Americans are diagnosed with Glioblastoma annually, causing significant morbidity and mortality. There has been no cure for Glioblastoma so far.³ Treatment options often include surgical removal of the tumor followed by concomitant radiation and adjuvant temozolomide TMZ chemotherapy which has been the standard of care for glioblastoma since decades, but exposure to high doses of ionizing radiation is a well-known exogenous risk factor for glioblastoma. The inability to cross the BBB is the major obstacle in achieving remission after surgical resection followed by chemotherapy and radiation.⁴ As a result, glioblastoma typically recurs within six to 8 months and the survival rate is generally less than 5%.² Despite the development of novel, complex, multidisciplinary, and targeted therapies the outcome for patients remains almost universally lethal.⁵ Therefore, the need for effective treatment is undeniable.

For this reason, it has been a priority area in cancer research. Recently, US biotech company Northwest Biotherapeutics has developed a brain cancer vaccine, called DCVax, which is designed to help patients' immune system to target their tumors that may prolong their life by months

or, in some cases, years.⁵ Thus, opening a door for the development of innovative therapy for targeting glioblastoma. The vaccine is created for each patient individually by isolating dendritic cells, from their blood which is then primed with biomarkers from a sample of the patient's tumor.⁶ Dendritic cells present tumor antigens to the immune system, prime T cells, and mobilize antitumor responses.⁶

To evaluate the safety of the vaccine and its impact on survival time in patients with Glioblastoma, a phase 3 randomized control trial was conducted.⁷ In this trial, 348 patients newly diagnosed with Glioblastoma were tested at King's College Hospital and other centers around the world for 8 years.⁷ Patients had surgery to remove their tumors as much as possible, followed by radiation and chemotherapy as the standard treatment for Glioblastoma.⁷ Among these patients, two out of three were treated with the vaccine, DCVax-L, with the remaining one-third receiving a placebo.⁷ The astonishing result of the trial has shown that newly diagnosed patients who received the vaccine survived for 19.3 months compared to 16.5 months for those who received a placebo.⁸ Overall 13% of all trial participants treated with DCVax lived more than 5 years after diagnosis compared with 5.7% in the comparison group

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who did so.⁸ Moreover, this is the first time in 17 years that such a significant result has been achieved in a Phase 3 trial of a systemic treatment for newly diagnosed Glioblastoma, and it's the first treatment in 27 years for patients with GBM recurrence.⁹

Thus, this development represents a major step forward in our efforts to combat this devastating disease. Based on the findings of the trials evaluating the drug's efficacy, it has the potential to improve the quality of life for patients, especially for the elderly and those unable to have surgery. A global clinical trial has concluded that the DCVax is the world's first vaccine to treat deadly cancerous brain tumors that could help patients to live for years.⁹ This breakthrough could benefit 2500 people a year in the UK being diagnosed with Glioblastoma.⁹ It has also been shown that this therapy can be used to treat cancers other than Glioblastoma.⁹

However, due to high recurrence rate and lethal outcomes, the treatment of glioblastoma has seen significant transformation, switching from an aggressive surgical strategy to a more cautious one. The endorsement of the vaccine is a commendable achievement, and it demonstrates the unwavering commitment of researchers and healthcare professionals to discovering effective treatments for such lethal disease. Furthermore, vaccine may enhance the quality of life of a patient and provides a new hope for patients and their families. Thus, it is crucial that we continue to support research into Glioblastoma and the development of novel treatments so that we can envision a future where this disease is eradicated.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Author's note

Not commissioned, externally peer reviewed.

Contributorship

Areeba Fareed and Samia Rohail wrote the draft. Alishba Adnan and Abdul Moiz Khan proofread it. All authors reviewed and edited the manuscript and approved the final version of the manuscript.

Data availability

No new dataset generated.

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