Opinion
Volume 9:6, 2022

International Journal of Neurorehabilitation

ISSN: 2376-0281 Open Access

An Overview of Glioblastoma

Angela Vincent*

Department of Psychosis Studies, Institute of Psychiatry, Psychology and Neuroscience, King's College London, London, UK

Introduction

One of the most dangerous cancers that start in the brain is glioblastoma, formerly known as glioblastoma multiforme (GBM). Initial glioblastoma symptoms and indications are vague. They could include headaches, personality changes, nausea, and stroke-like symptoms. Symptoms frequently get worse quickly and could even lead to coma. The majority of glioblastoma instances have an unknown source. Uncommon risk factors include a history of radiation therapy and hereditary conditions including neurofibromatosis and Li-Fraumeni syndrome. Glioblastomas account for 15% of all brain tumours. They may originate from healthy brain cells or grow from a low-grade astrocytoma that already exists. Typically, a CT scan, MRI scan, and tissue sample are used to make the diagnosis.

There is currently no known way to stop cancer. Surgery is typically the first step in treatment, followed by chemotherapy and radiation therapy. Chemotherapy usually includes the drug temozolomide. Steroids taken at high doses can aid with edoema and discomfort relief. Surgical excision of the tumour (decompression) is associated with an increase in survival, although only by a few months. Even with the best care, the cancer almost always returns. Less than 5-10% of persons survive longer than five years after diagnosis, with the average survival time being 10–13 months. The average duration of survival without therapy is three months. After meningioma, it is the most frequent brain tumour and the most frequent cancer that starts in the brain. Each year, the disease affects about 3 in 100,000 people. The disease affects men more often than women, and the typical age at diagnosis is 64 [1].

Description

Signs and symptoms

Seizures, headaches, nausea, and vomiting, as well as memory loss, changes in personality, mood, or concentration, are common symptoms. The location of the tumour, rather than its pathological characteristics, determines the type of symptoms that are caused. A tumour may occasionally be asymptomatic up until it grows to a large size before exhibiting symptoms quickly [1,2].

Risk factors

Most cases lack a clear reason. Low-grade astrocytomas, a different kind of brain tumour, account for about 5% of new cases [2].

Genetics: Genetic conditions such neurofibromatosis, Li-Fraumeni syndrome, tuberous sclerosis, or Turcot syndromes are uncommon risk factors. Another danger is radiation therapy in the past. For unexplained reasons, men are more likely to experience it.

***Address for Correspondence:** Angela Vincent, Department of Psychosis Studies, Institute of Psychiatry, Psychology and Neuroscience, King's College London, London, UK, E-mail: Vincent_a@gmail.com*

Date of Submission: 03 June, 2022, Manuscript No. ijn-22- 73218; **Editor assigned:** 06 June, 2022, PreQC No. P-73218; **Reviewed:** 17 June, 2022, QC No. Q-73218; **Revised:** 24 June, 2022, Manuscript No. R-73218; **Published:** 30 June, 2022, DOI: 10.37421/2376-0281.2022.9.470

Environmental: Other connections include exposure to tobacco smoke, chemicals, and employment in the rubber or petroleum industries. Infections with the viruses SV40, HHV-6, and CMV have all been linked to glioblastoma.

Diagnosis

Glioblastomas frequently show up as ring-enhancing lesions when seen with an MRI. Nevertheless, the look is not particular, as different lesions including abscesses, metastases, tumefactive multiple sclerosis and other entities may have a similar appearance. A stereotactic biopsy or a craniotomy with tumour removal and pathologic confirmation is necessary for the definitive diagnosis of a suspected GBM on a CT scan or an MRI. A biopsy or partial tumour removal may result in an undergrading of the lesion because the tumour grade is dependent on the most malignant part of the tumour. However, pathology continues to be the gold standard for diagnosis and molecular characterization. Imaging of tumour blood flow using perfusion MRI and measuring tumour metabolite concentration with MR spectroscopy may add diagnostic value to standard MRI in some cases by showing increased relative cerebral blood volume and increased choline peak, respectively.

It's crucial to distinguish primary glioblastoma from secondary glioblastoma. Depending on the case, these tumours either develop spontaneously (de novo) or have advanced from a lower-grade glioma. This evaluation is crucial in determining the prognosis and course of treatment for patients with primary glioblastomas since they have a worse prognosis, different tumour biology, and possibly different therapeutic responses. IDH1 mutations are present in over 80% of secondary glioblastomas but are uncommon in primary glioblastomas (5 -10 percent). Since primary and secondary glioblastomas have extremely similar histopathologies and cannot be reliably distinguished without the use of molecular biomarkers, IDH1 mutations are an effective technique [3].

Prevention

Glioblastoma cannot now be prevented in any way. Unlike certain other types of cancer, most gliomas occur without prior notice, and there is currently no known strategy to avoid them [3].

Treatment

Glioblastoma treatment is challenging because of a number of challenging factors [4]:

- Traditional treatments are ineffective against the tumour cells.
- The effects of conventional therapy can harm the brain.
- The brain can only mend itself to a certain extent.
- The blood-brain barrier prevents several medications from reaching the tumour.

Prognosis

Less than 1 to 3 percent of patients survive longer than five years, with 10 to 13 months being the most typical length of living after diagnosis. Five-year survival in the United States between 2012 and 2016 was 6.8%. Survival is approximately 3 months without treatment. Although very uncommon, complete cures have been documented. Age (> 60 years) is associated with a greater prognosis risk. The most common cause of death is extensive tumour infiltration accompanied by cerebral edoema and raised intracranial pressure.

Longer survival is correlated with higher initial Karnofsky performance score (KPS) and MGMT methylation. The methylation status of the MGMT promoter can be assessed using a DNA assay on glioblastomas. Due in part

to enhance sensitivity to temozolomide, patients with a methylation MGMT promoter have a longer survival rate than those with an unmethylated MGMT promoter. The IDH1 gene mutation, which may be detected via DNA-based techniques or by immunohistochemistry using an antibody against the most prevalent mutation, specifically IDH1-R132H, is another good prognostic indicator for glioblastoma patients [5].

Research

Gene therapy: Although animal models and early-phase clinical trials of gene therapy for glioblastoma were effective, as of 2017, all gene-therapy medications that had been evaluated in phase-III clinical trials for glioblastoma had failed. Long lasting luminescence nanoparticles with a core-shell nanostructure have been created by scientists. For efficient gene delivery and tracking, with successful outcomes, PPT stands for polyetherimide, PEG, and trans-activator of transcription (TRAIL is the human tumour necrosis factor-related apoptosis-induced ligand). This TRAIL ligand was particularly designed to cause glioblastoma cells to undergo apoptosis. Despite the fact that this study was still undergoing clinical trials in 2017, it has demonstrated diagnostic and therapeutic functions and will spark significant interest in clinical stem cell-based therapy applications.

Oncolytic virotherapy: Oncolytic virotherapy is a revolutionary medicine that is still in the preclinical and clinical stages of development. In phases I and II of clinical trials for glioblastoma therapy, several viruses, including herpes simplex virus, adenovirus, poliovirus, and reovirus, are being studied and have been proven to increase overall survival.

Intranasal drug delivery**:** In an effort to increase medicine concentrations in the brain and hopefully make them more potent, direct nose-to-brain drug delivery is being investigated. The natural substance perillyl alcohol for intranasal delivery as an aerosol was explored in a clinical phase-I/II research with glioblastoma patients in Brazil. The outcomes were positive. As of 2016, a comparable experiment has been started in the United States.

Conflict of Interest

None.

References

1. Young, Richard M., Aria Jamshidi, Gregory Davis and Jonathan H. Sherman. "Current trends in the surgical management and treatment of adult glioblastoma". *Ann Transl Med* 3 (2015): 121.
2. Gallego, O. "Nonsurgical treatment of recurrent glioblastoma". *Curr Oncol* 22 (2015): 273-281.
3. Bleeker, Fonnet E., Remco J. Molenaar and Sieger Leenstra. "Recent advances in the molecular understanding of glioblastoma". *J Neurooncol* 108 (2012): 11-27.
4. Van Meir, Erwin G., Costas G. Hadjipanayis, Andrew D. Norden and Hui-Kuo Shu, et al. "Exciting new advances in neuro-oncology: The avenue to a cure for malignant glioma". *CA Cancer J Clin* 60 (2010): 166-193.
5. McNeill, Katharine A. "Epidemiology of brain tumors." *Neurol Clin* 34 (2016): 981-998.

How to cite this article: Vincent, Angela. “An Overview of Glioblastoma”. Int J Neurorehabilitation Eng 9 (2022): 470.