Glioma

- The mTOR pathway in Gliomas: From molecular insights to targeted therapies
- New iboga-type indole alkaloids with anti-glioma activity from Tabernaemontana pachysiphon
- Cell membrane-coated nanoparticles in neurodegenerative disorders management
- Mechanisms and Therapeutic Implications of Glioma-Neuron Interactions
- Amphiphilic Poly(γ-glutamic acid) Derivatives for Delivering Doxorubicin in Cancer Cells
- Clinical outcome and deep learning imaging characteristics of patients treated by radio-chemotherapy for a "molecular" glioblastoma
- Advances of MR imaging in glioma: what the neurosurgeon needs to know
- Advances in the Optimization of CAR-T-Cell-Based Therapeutic Approaches to Enhance Antitumor Efficacy in Glioblastoma Treatment

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A glioma is a type of tumor that arises from glial cells, which are supportive cells of the central nervous system (CNS). Glial cells include astrocytes, oligodendrocytes, and ependymal cells, and they play a crucial role in supporting and protecting nerve cells in the brain and spinal cord.

Gliomas are categorized by the World Health Organization (WHO) into distinct tumor subtypes and tumor grades according to a combination of histologic and molecular features [1].

Studies on gliomas suggested that the microenvironment of human gliomas contains both glioma stem cells (GSCs) and glioma associated (GA)-mesenchymal stem cells (MSCs; (GA-MSCs). Also, studies have suggested that nano- sized vesicles, termed exosomes, have been recently observed to contribute towards intercellular communication within the tumor niche [2].

Epidemiology

Glioma is the most frequent primary cerebral tumor in adults, with an incidence of 4–5/100 000 individuals. Gliomas are the second leading cause of cancer mortality in adults under the age of 35, the fourth leading cause in those under the age of 54, and result in death in approximately 13 770 individuals per year in the United States.

Approximately 89,000 new primary brain tumors are diagnosed in the United States each year, for which 27% are gliomas and 32.8% are malignant gliomas [3].

The are more frequent among males [4].

Classification

see Glioma Classification.

Biomarker

see Glioma Biomarker.

Pathogenesis

see Glioma pathogenesis.

Spread

see Glioma spread.

Recurrence

see Glioma recurrence.

Clinical Features

Many gliomas become symptomatic with either seizures or focal neurological deficits and are subsequently detected via MRI.

see Glioma-related epilepsy.

Maternal migraine was positively associated with risk for non-Hodgkin lymphoma (odds ratio [OR] = 1.70, 95% confidence interval [CI]: 1.01-2.86), central nervous system tumors ([OR = 1.31, 95% CI: 1.02-1.68], particularly glioma [OR = 1.64, 95% CI: 1.12-2.40]), neuroblastoma (OR = 1.75, 95% CI: 1.00-3.08), and osteosarcoma (OR = 2.60, 95% CI: 1.18-5.76).

Associations with maternal migraine were observed for several childhood cancers, including neuronal tumors. The findings raise questions about the role of lifestyle factors, sex hormones, genetic, and neurochemical factors in the relationship between migraine and childhood cancers [5)]

Diagnosis

see Glioma Diagnosis.

Guidelines

see Glioma Guidelines

Treatment

see Glioma treatment.

Outcome

see Glioma outcome.

Books

see Glioma Books.

Research

see Glioma research

Retrospective observational studies

Lin et al. retrospectively analyzed routine MR and IVIM-DWI data from 85 patients with pathologically confirmed brain gliomas from January 2017 to May 2023. The data were divided into a training set (N=61) and a test set (N=24) in a 7:3 ratio. Regions of interest (ROIs) of brain gliomas, including the solid tumor region (rCET), edema region (rE), and necrotic region (rNec), were delineated using 3D-Slicer software and projected onto the D, D*, and f sequences. A total of 1037 features were extracted from each ROI, resulting in 3111 features per patient. Age was incorporated in the calculation of the Radscore, and a clinical-imaging genomics combined model was constructed, from which a nomogram graph was generated. Separate models were built for the D, D*, and f parameters. The AUC value of the D parameter model was 0.97 (95% CI: 0.93-1.00) in the training set and 0.91 (95% CI: 0.79-1.00) in the validation set, which was significantly higher than that of the D* parameter model (0.90, 0.82) and the f parameter model (0.89, 0.91). The imaging genomics nomogram based on IVIM-DWI can effectively predict the ATRX gene status of patients with brain gliomas, with the D parameter showing the highest efficacy [6].

Case series

Glioma case series.

Glioma database

Glioma database

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