Diffuse midline glioma H3 K27-altered treatment

Currently, there is no cure for this condition, but there are treatment options that aim to manage symptoms, slow down the tumor's growth, and improve the patient's quality of life.

Here are some of the treatment approaches used for diffuse midline glioma H3 K27-altered:

Surgery: In some cases, surgery may be performed to remove as much of the tumor as possible without causing significant damage to critical brain structures. However, due to the location of these tumors in the brainstem and spinal cord, complete surgical resection is often not feasible.

Radiation Therapy: Radiation therapy is typically a standard treatment for diffuse midline gliomas. It helps shrink the tumor and alleviate symptoms. However, the benefits may be temporary, and the tumor may eventually recur.

Chemotherapy: Chemotherapy may be used in combination with radiation therapy to improve outcomes. Temozolomide and other chemotherapy drugs may be considered.

Targeted Therapies: There are ongoing clinical trials exploring targeted therapies that aim to block the effects of the H3 K27M mutation specifically. These treatments are still experimental, and their long-term effectiveness is not well-established.

Immunotherapy: Immunotherapy, such as checkpoint inhibitors, is also being investigated as a potential treatment option. These therapies work by boosting the immune system's ability to target and attack cancer cells.

Experimental Therapies: Patients may be eligible for clinical trials of new and experimental treatments. These trials can provide access to novel therapies that are not yet widely available.

Palliative Care: Given the aggressive nature of these tumors and their location, palliative care plays a significant role. It focuses on managing symptoms, providing pain relief, and improving the patient's quality of life.

It's important to note that the treatment approach for each patient is highly individualized and depends on various factors, including the tumor's location, size, the patient's overall health, and the availability of clinical trials. Care is often provided by a multidisciplinary team of healthcare professionals, including neuro-oncologists, neurosurgeons, radiation oncologists, and palliative care specialists. Patients and their families should work closely with their medical team to make informed decisions about treatment options.

Studies (i) identified BRG1 (encoded by SMARCA4), the catalytic subunit of the mammalian SWI/SNF (BAF) chromatin remodeling complex, as a novel dependency in pediatric H3K27M glioma; (ii) investigated the molecular mechanisms underlying the maintenance of the progenitor state; and (iii) demonstrated efficacy for BRG1 inhibitors. The authors identified the BRG1 ATPase as a dependency in pediatric H3K27M-mutant DMG. SOX10 recruits BRG1 to regulatory elements to drive progression. Pharmacologically targeting BRG1 reduced tumor volume and improved survival in vivo. Inhibiting BRG1 ATPase represents a potential therapeutic strategy for pediatric H3K27M DMG [1)].

Immunotherapy

Diffuse midline glioma H3 K27-altered Immunotherapy

Focused ultrasound-mediated blood-brain barrier opening for diffuse midline glioma

Focused ultrasound-mediated blood-brain barrier opening for diffuse midline glioma.

Salvage boron neutron capture therapy

Huang et al. report the experience with boron neutron capture therapy (BNCT), a new treatment process, and its efficacy in treating children with recurrent DMG.

Methods: From September 2019 to July 2022, we treated 6 children affected by recurrent DMG. With the collaboration of Taipei Veteran General Hospital (TVGH) and National Tsing-Hua University (NTHU), each patient received two sessions of BNCT within 1 month.

Results: Among the six patients, three showed partial response and the rest had stable disease after the treatment. The overall survival and recurrence-free survival duration after treatment were 6.39 and 4.35 months, respectively. None of the patients developed severe side effects, and only one patient developed brain necrosis, which was most likely resulted from previous hypofractionated radiotherapy received.

Conclusion: BNCT elicited sufficient tumor response with low normal tissue toxicity; it may benefit vulnerable pediatric patients with DMG [2)]

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1)
Beytagh MC, Weiss WA. Epigenetic Rewiring Underlies SMARCA4-Dependent Maintenance of Progenitor State in Pediatric H3K27M Diffuse Midline Glioma. Cancer Discov. 2022 Dec 2;12(12):2730-2732. doi: 10.1158/2159-8290.CD-22-1030. PMID: 36458436.
2)
Huang WH, Huang TY, Lin CM, Mu PF, Lee YY, Liu SH, Hsu SM, Chen YW. Salvage boron neutron capture therapy for pediatric patients with recurrent diffuse midline glioma. Childs Nerv Syst. 2023 Feb 23. doi: 10.1007/s00381-023-05850-2. Epub ahead of print. PMID: 36821007.

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