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Clinical outcome, radiological findings, and genetic features of IDH-mutant brainstem glioma in adults

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Abstract

Background: With the recent advent of genetic testing, IDH-mutant glioma has been found among adult brainstem gliomas. However, the clinical outcome and prognosis of IDH-mutant brainstem gliomas in adults have not been elucidated. This study aimed to investigate the clinical outcome, radiological findings, and genetic features of adult patients with IDH-mutant diffuse brainstem gliomas.

Methods: Data from adult patients with brainstem glioma at Hokkaido University Hospital between 2006 and 2022 were retrospectively analyzed. Patient characteristics, treatment methods, genetic features, and prognosis were evaluated.

Results: Of 12 patients with brainstem glioma with proven histopathology, 4 were identified with IDH mutation. All patients underwent local radiotherapy with 54 Gray in 27 fractions combined with chemotherapy with temozolomide. Three patients had IDH1 R132H mutation and one had IDH2 R172G mutation. The median progression-free survival and overall survival were 68.4 months and 85.2 months, respectively, longer than that for IDH-wildtype gliomas (5.6 months and 12.0 months, respectively). At the time of initial onset, contrast-enhanced lesions were observed in two of the four cases in magnetic resonance imaging.

Conclusion: As some adult brainstem gliomas have IDH mutations, and a clearly different prognosis from those with IDH-wildtype, biopsies are proactively considered to confirm the genotype.

Keywords: Astrocytoma; Brainstem; DIPG; Glioma; IDH-mutant; MRI.

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