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Published Online: 19 Sep 2006  
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**Original Article**

**Prognostic stratification of patients with anaplastic gliomas according to genetic profile**

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**Funded by:**

- Delegation a la Recherche Clinique; Grant Number: AP-HP Grant MUL 03012
- Ligue Nationale Contre le Cancer, comite d'Ille et Vilaine

**KEYWORDS**

anaplastic gliomas • EGFR • p53 • 1p • 19q • recursive partitioning analysis

**ABSTRACT**

**BACKGROUND.**

There is a need to improve the current, controversial, and poorly reproducible classification of anaplastic gliomas, which represent a highly heterogeneous entity in terms of survival.

**METHODS.**

The impact of the most common genetic alterations on survival was investigated based on 156 anaplastic gliomas: Among the patients who were included, the gender ratio was 1.32, the median age was 45.5 years (range, 20-83 years), and the median Karnofsky performance status was 70 (range, 40-100). Genetic analysis included a search for loss of heterozygosity (LOH) on chromosomes 1p and 19q; amplification of chromosomes 9p and 10q and of the epidermal growth factor receptor (*EGFR*), cyclin-dependent kinase 4 (*CDK4*) and mouse double-minute (*MDM2*) genes; and p53 expression.

**RESULTS.**

The median survival was 33.5 months, and the median progression-free survival was 15.8 months. In a univariate analysis, LOH on 1p and 19q was correlated with longer survival, whereas p53 expression, LOH on 9p, LOH on 10q, amplified *EGFR*, and deleted *CDKN2A* were correlated with shorter survival. LOH on 1p and 19q were associated with oligodendrogliomas, LOH on 10q was related to *EGFR* amplification, and LOH on 1p and 19q was mutually exclusive with *EGFR* amplification and LOH on 10q. In a multivariate analysis, the significant prognostic factors were age, histology, LOH on 1p and 19q, and *P16/CDKN2A* deletion. Recursive partitioning analysis (RPA) divided the whole group hierarchically into 3 distinct prognostic subgroups: Group A with 1p19q codeletion (median survival, 98 months), Group B with *EGFR* amplification (median survival, 17 months), and Group CC (median survival, 31 months), providing a basis for a genetically based prognostic subclassification for patients with Grade III gliomas.

**CONCLUSIONS.**

The search for 1p19q codeletion and *EGFR* receptor amplification provides a simple, clinically relevant prognostic subclassification of grade III gliomas. Cancer 2006. © 2006 American Cancer Society.

Received: 25 May 2006; Revised: 6 July 2006; Accepted: 14 July 2006

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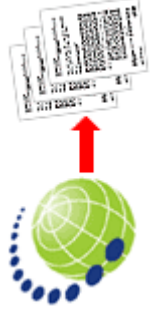
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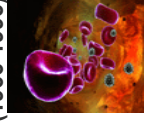
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