

PubMed

U.S. National Library of Medicine
National Institutes of Health



Display Settings: Abstract

[J Clin Oncol](#). 2010 May 17. [Epub ahead of print]

Integrated Molecular Genetic Profiling of Pediatric High-Grade Gliomas Reveals Key Differences With the Adult Disease.

Paugh BS, Qu C, Jones C, Liu Z, Adamowicz-Brice M, Zhang J, Bax DA, Coyle B, Barrow J, Hargrave D, Lowe J, Gajjar A, Zhao W, Broniscer A, Ellison DW, Grundy RG, Baker SJ.

St Jude Children's Research Hospital, Memphis, TN; Institute for Cancer Research; Royal Marsden National Health Service Foundation Trust, Surrey; and The Children's Brain Tumour Research Centre, University of Nottingham, Nottingham, United Kingdom.

Abstract

PURPOSE To define copy number alterations and gene expression signatures underlying pediatric high-grade glioma (HGG). **PATIENTS AND METHODS** We conducted a high-resolution analysis of genomic imbalances in 78 de novo pediatric HGGs, including seven diffuse intrinsic pontine gliomas, and 10 HGGs arising in children who received cranial irradiation for a previous cancer using single nucleotide polymorphism microarray analysis. Gene expression was analyzed with gene expression microarrays for 53 tumors. Results were compared with publicly available data from adult tumors. **Results** Significant differences in copy number alterations distinguish childhood and adult glioblastoma. PDGFRA was the predominant target of focal amplification in childhood HGG, including diffuse intrinsic pontine gliomas, and gene expression analyses supported an important role for deregulated PDGFRalpha signaling in pediatric HGG. No IDH1 hotspot mutations were found in pediatric tumors, highlighting molecular differences with adult secondary glioblastoma. Pediatric and adult glioblastomas were clearly distinguished by frequent gain of chromosome 1q (30% v 9%, respectively) and lower frequency of chromosome 7 gain (13% v 74%, respectively) and 10q loss (35% v 80%, respectively). PDGFRA amplification and 1q gain occurred at significantly higher frequency in irradiation-induced tumors, suggesting that these are initiating events in childhood gliomagenesis. A subset of pediatric HGGs showed minimal copy number changes. **CONCLUSION** Integrated molecular profiling showed substantial differences in the molecular features underlying pediatric and adult HGG, indicating that findings in adult tumors cannot be simply extrapolated to younger patients. PDGFRalpha may be a useful target for pediatric HGG, including diffuse pontine gliomas.

PMID: 20479398 [PubMed - as supplied by publisher]

[LinkOut](#) - more resources

You are here: [NCBI](#) > [Literature](#) > [PubMed](#)

[Write to the Help Desk](#)