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Radiotherapy for pediatric low-grade glioma

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Abstract

Introduction: Radiotherapy is a highly effective treatment for pediatric low-grade glioma, serving as the standard for evaluating progression-free and overall survival, as well as vision preservation. Despite its proven efficacy, concerns about treatment complications have led to increased use of chemotherapy and targeted therapy, which are associated with poorer progression-free survival outcomes.

Methods: This review by Indu Bansal and Thomas E. Merchant examines the indications, timing, and results of radiotherapy for pediatric low-grade glioma. The authors provide a comprehensive analysis of clinical management strategies, addressing the controversies surrounding the use and timing of radiotherapy compared to other therapies.

Results: The review highlights that while radiotherapy is essential for certain patients, particularly those who are not candidates for complete resection due to the tumor's infiltrative nature or location, it is often deferred in favor of systemic therapies. This deferral can lead to significant morbidity, including poor visual outcomes. Reports indicate that systemic therapy negatively impacts progression-free survival in patients who eventually undergo radiotherapy. Newer radiotherapy techniques have been developed to minimize complications, offering potential benefits over traditional methods.

Discussion: The evolving clinical management of pediatric low-grade glioma involves balancing the benefits of radiotherapy with concerns about its side effects. Although systemic therapies are increasingly favored, their associated inferior progression-free survival and potential for significant morbidity underscore the need for careful consideration of radiotherapy, particularly in older children, adolescents, or those with progressive disease post-systemic therapy. The emerging role of targeted therapy presents additional challenges, including uncertainties about long-term side effects and its interaction with radiotherapy. Further research is needed to optimize treatment strategies and improve outcomes for pediatric patients with low-grade glioma.

Keywords: Pediatric low-grade glioma; Progression-free survival; Radiotherapy; Systemic therapy.