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Chemotherapy in pediatric low-grade gliomas (PLGG)

Alvaro Lassaletta [1], Michal Zapotocky [2], Eric Bouffet [3]

Affiliations

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Abstract

Pediatric low-grade gliomas (PLGG) are commonly treated with a combination of surgery, radiotherapy, and chemotherapy. Recent trends prioritize reducing long-term morbidities, particularly in younger patients. While historically chemotherapy was reserved for cases progressing after radiotherapy, evolving recommendations now advocate for its early use, particularly in younger age groups. The carboplatin and vincristine (CV) combination stands as a standard systemic therapy for PLGG, varying in dosage and administration between North America and Europe. Clinical trials have shown promising response rates, albeit with varying toxicity profiles. Vinblastine has emerged as another effective regimen with minimal toxicity. TPCV, a regimen combining thioguanine, procarbazine, lomustine, and vincristine, was compared to CV in a Children's Oncology Group trial, showing comparable outcomes, but more toxicity. Vinorelbine, temozolomide, and metronomic chemotherapy have also been explored, with varied success rates and toxicity profiles. Around 40-50% of PLGG patients require subsequent chemotherapy lines. Studies have shown varied efficacy in subsequent lines, with NF1 patients generally exhibiting better outcomes. The identification of molecular drivers like BRAF mutations has led to targeted therapies' development, showing promise in specific molecular subgroups. Trials comparing targeted therapy to conventional chemotherapy aim to delineate optimal treatment strategies based on molecular profiles. The landscape of chemotherapy in PLGG is evolving, with a growing focus on molecular subtyping and targeted therapies. Understanding the role of chemotherapy in conjunction with novel treatments is crucial for optimizing outcomes in pediatric patients with low-grade gliomas.

Keywords: Adolescents; Chemotherapy; Children; Pediatric low-grade gliomas; Progression; Treatment.