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PROTON THERAPY FOR ADULT-TYPE DIFFUSE GLIOMA: A SYSTEMATIC REVIEW

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Abstract

Background: We conducted a systematic review to evaluate outcomes and toxicities associated with proton therapy in the treatment of adult-type diffuse glioma.

Methods: Following PRISMA guidelines, we searched PubMed for both prospective and retrospective studies on proton therapy for adult diffuse gliomas, including low-grade gliomas and glioblastomas. Survival and toxicity outcomes were reported separately for these glioma types.

Results: Twelve studies from 2013 to 2023 were selected, comprising 3 prospective and 9 retrospective studies. The analysis covered 570 patients with low-grade gliomas and 240 patients with glioblastoma or WHO grade 4 gliomas. Proton therapy was found to be comparable to conventional radiotherapy in terms of survival outcomes. Its main advantage is the ability to minimize radiation exposure to healthy tissues.

Discussion: Proton therapy offers comparable survival outcomes to conventional radiotherapy for adult diffuse gliomas and may enhance treatment tolerance, especially regarding neurocognitive function. A major limitation of this review is the predominance of retrospective studies. Future research should ensure rigorous patient selection and adhere to the latest WHO 2021 classification.

Keywords: Glioblastoma; Glioma; Low grade glioma; Proton therapy; Radiotherapy; Systematic review.

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