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Genetic Biomarkers in Astrocytoma: Diagnostic, Prognostic, and Therapeutic Potential

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Abstract

Astrocytoma are the most common adult brain tumor, with Glioblastoma being the deadliest neuro-related malignancy. Despite advances in oncology, the prognosis for Astrocytoma, especially Glioblastoma, remains poor, and tracking disease progression is challenging due to a lack of robust biomarkers. Genetic biomarkers, including microRNAs, cell-free DNA, circulating tumor DNA, circular RNA, and long non-coding RNA (lncRNA), can serve as potential diagnostic and therapeutic targets. In this review, we examine the existing literature, analyzing the various less established liquid and tumor genetic biomarkers and their potential to act as diagnostic, prognostic, and therapeutic targets. We highlight the clinical challenges and limitations in implementing liquid biopsy strategies in clinical practice. The article discusses the potential of liquid biopsies as valuable tools for personalized Astrocytoma management while emphasizing the need for standardized protocols and further advancements to establish their clinical utility and therapeutic application.

Keywords: Astrocytoma; Biomarker; Diagnostic; Glioblastoma.

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