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Cerebrospinal Fluid Liquid Biopsies in the Evaluation of Adult Gliomas

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Abstract

Purpose of review: This review aims to discuss recent research regarding the biomolecules explored in liquid biopsies and their potential clinical uses for adult-type diffuse gliomas.

Recent findings: Evaluation of tumor biomolecules via cerebrospinal fluid (CSF) is an emerging technology in neuro-oncology. Studies to date have already identified various circulating tumor DNA, extracellular vesicle, micro-messenger RNA and protein biomarkers of interest. These biomarkers show potential to assist in multiple avenues of central nervous system (CNS) tumor evaluation, including tumor differentiation and diagnosis, treatment selection, response assessment, detection of tumor progression, and prognosis. In addition, CSF liquid biopsies have the potential to better characterize tumor heterogeneity compared to conventional tissue collection and CNS imaging. Current imaging modalities are not sufficient to establish a definitive glioma diagnosis and repeated tissue sampling via conventional biopsy is risky, therefore, there is a great need to improve non-invasive and minimally invasive sampling methods. CSF liquid biopsies represent a promising, minimally invasive adjunct to current approaches which can provide diagnostic and prognostic information as well as aid in response assessment.

Keywords: Central nervous system tumors; Cerebrospinal fluid analysis; Extracellular vesicles; Glioma; Liquid biopsy; ctDNA.

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