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Liquid biomarkers in glioma

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Abstract

An ideal biomarker must meet several parameters to enable its successful adoption; however, the nature of glioma makes it challenging to discover valuable biomarkers. While biomarkers require simplicity for clinical implementation, anatomical features and the complexity of the brain make it challenging to perform histological examination. Therefore, compared to biomarkers from general histological examination, liquid biomarkers for brain disease offer many more advantages in these minimally invasive methods. Ideal biomarkers should have high sensitivity and specificity, especially in malignant tumors. The heterogeneous nature of glioma makes it challenging to determine useful common biomarkers, and no liquid biomarker has yet been adopted clinically. The low incidence of brain tumors also hinders research progress. To overcome these problems, clinical applications of new types of specimens, such as extracellular vesicles and comprehensive omics analysis, have been developed, and some candidate liquid biomarkers have been identified. As against previous reviews, we focused on and reviewed the sensitivity and specificity of each liquid biomarker for its clinical application. Perusing an ideal glioma biomarker would help uncover the common underlying mechanism of glioma and develop new therapeutic targets. Further multicenter studies based on these findings will help establish new treatment strategies in the future.

Keywords: Biomarker; Blood; Cerebrospinal fluid; Glioma.

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