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Long Non-coding RNA LINC00152 is a Potential Prognostic Biomarker in Patients with High Grade Glioma

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Introduction

Gliomas are categorized into low-grade (WHO Grade II) and high-grade gliomas (HGGs, WHO Grades III and IV). Due to the infiltrative growth and chemo and radiotherapy resistance, the progress of treatments for HGGs is hampered. The role of LINC00152 in high grade glioma (HGGs) remains unclear.

Methods

We collected Chinese Glioma Genome Atlas (CGGA) microarray, CGGA RNA sequencing and GSE16011 datasets to evaluate the expression and prognostic relationship of LINC00152 in patients with HGGs. Knockdown assay was performed to determine the function of LINC00152 in glioma development and progression in vitro and in vivo.

Results

It showed that the expression of LINC00152 was increased with glioma grade, especially in mesenchymal TCGA subtype. Moreover, LINC00152 was independently associated with poor prognosis and the overall survival (OS) of highly expressed group was shorter than lowly expressed group (median OS 14.77 vs. 9.65 months; P = 0.0216) in CGGA microarray dataset. The results were further validated in two additional datasets. Based on the expression of LINC00152, 4288 (2519 positively; 1769 negatively) probes were extracted for performing Biological Process analysis using DAVID (The Database for Annotation, Visualization and Integrated Discovery). The results showed that positively regulated genes were enriched in immune response, apoptotic process, cell adhesion, and regulation of cell proliferation, et al. The clinical and molecular features of HGG patients indicated that patients in LINC00152 highly expressed group tended to displayed mesenchymal type, old age (= 46), IHD1-WT, MGMT unmethylated, non-chemotherapy and low KPS. Functionally, knockdown of LINC00152 can inhibit the cell proliferation, migration and invasion, and increase the sensitivity of chemotherapy in vitro. Furthermore, it indicated that knockdown of LINC00152 could inhibit tumor growth in vivo.

Learning Objectives

1) These findings indicate that LINC00152 could serve as a potential prognostic biomarker in patients with HGG, 2) It is the first study to report that LINC00152 plays an important role in HGGs, 3) Knockdown of LINC00152 can inhibit the cell proliferation, migration and invasion, and increase the sensitivity of chemotherapy in vitro. It indicated that knockdown of LINC00152 could inhibit tumor growth in vivo.

Conclusions

Our results indicate that LINC00152 could serve as a potential prognostic biomarker in patients with HGG.