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Metformin use is associated with longer survival in glioblastoma patients with MGMT gene silencing

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Abstract

Purpose: New treatments are needed to improve the overall survival of patients with glioblastoma Metformin is known for anti-tumorigenic effects in cancers, including breast and pancreas cancers. In this study, we assessed the association between metformin use and overall survival in glioblastoma patients.

Methods: We retrospectively studied 241 patients who underwent surgery at diagnosis of glioblastoma between 2014 and 2018. Metformin was used for pre-existing type 2 diabetes mellitus or in the prevention or management of glucocorticoid induced hyperglycemia. Kaplan-Meier curves and log-rank p test were used for univariate analysis. Cox-proportional hazards model was used to generate adjusted hazard ratios for multivariate analysis.

Results: Metformin use was associated with longer survival in patients with tumors that had a methylated O6-methylguanine DNA methyltransferase gene (MGMT) promoter (484 days 95% CI: 56-911 vs. 394 days 95% CI: 249-538, Log-Rank test: 6.5, p = 0.01). Cox regression analysis shows that metformin associates with lower risk of death at 2 years in patients with glioblastoma containing a methylated MGMT promoter (aHR = 0.497, 95% CI 0.26-0.93, p = 0.028).

Conclusion: Our findings suggest a survival benefit with metformin use in patients with glioblastomas having methylation of the MGMT promoter.

Keywords: Diabetes; Glioblastoma; MGMT methylation; Metformin; Survival.