ABSTRACT

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Melatonin inhibits the malignant progression of glioblastoma via regulating miR-16-5p/PIM1.

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OBJECTIVES: Melatonin (MT) is a pineal hormone with antineoplastic potential. This study aims to explore the therapeutic potential and mechanism of MT on glioblastoma (GBM).

METHODS: A human GBM cell line, LN229 was used for evaluating the function of MT. Cell viability, apoptosis, and migration were detected by CCK-8, flow cytometry, and transwell assays, respectively. The mRNA and protein expression of specific genes were measured by qRT-PCR and western blot, respectively. The regulatory relationship between miR-16-5p and PIM1 was validated by dual luciferase reporter gene assay. A mouse xenograft model was established to prove the anti-tumor effect and related mechanisms of MT in vivo.

RESULTS: MT inhibited the viability and migration, and promoted the apoptosis of LN229 cells in a dose-dependent manner. MiR-16-5p was dose-dependently up-regulated by MT in LN229 cells, which negatively regulated its target PIM1. MiR-16-5p inhibitor eliminated the anti-tumor effect of MT in LN229 cells, while si-PIM1 reversed the effect of miR-16-5p inhibitor in MT-treated cells. MT inhibited the tumor growth in vivo and MT-induced PIM1 down-regulation was reversed by miR-16-5p inhibition in tumor tissues.

CONCLUSIONS: MT inhibits the malignant progression of GBM via regulating miR-16-5p-midiated PIM1.

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