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Rapamycin inhibits the growth of glioblastoma.


Abstract

The molecular target of rapamycin (mTOR) is up-regulated in glioblastoma (GBM) and this is associated with the rate of cell growth, stem cell proliferation and disease relapse. Rapamycin is a powerful mTOR inhibitor and strong autophagy inducer. Previous studies analyzed the effects of rapamycin in GBM cell lines. However, to our knowledge, no experiment was carried out to evaluate the effects of rapamycin neither in primary cells derived from GBM patients nor in vivo in brain GBM xenograft. These data are critical to get a deeper insight into the effects of such adjuvant therapy in GBM patients. In the present study, various doses of rapamycin were tested in primary cell cultures from GBM patients. These effects were compared with that obtained by the same doses of rapamycin in GBM cell lines (U87Mg). The effects of rapamycin were also evaluated in vivo, in brain tumors developed from mouse xenografts. Rapamycin, starting at the dose of 10nm inhibited cell growth both in U87Mg cell line and primary cell cultures derived from various GBM patients. When administered in vivo to brain xenografts in nude mice rapamycin almost doubled the survival time of mice and inhibited by more than 95% of tumor volume.

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