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Cannabinoids in the treatment of glioblastoma

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Abstract

Glioblastoma (GBM) is the most prevalent primary malignant tumor of the nervous system. While the treatment of other neoplasms is increasingly more efficacious the median survival rate of GBM patients remains low and equals about 14 months. Due to this fact, there are intensive efforts to find drugs that would help combat GBM. Nowadays cannabinoids are becoming more and more important in the field of cancer and not only because of their properties of antiemetic drugs during chemotherapy. These compounds may have a direct cytotoxic effect on cancer cells. Studies indicate GBM has disturbances in the endocannabinoid system-changes in cannabinoid metabolism as well as in the cannabinoid receptor expression. The GBM cells show expression of cannabinoid receptors 1 and 2 (CB1R and CB2R), which mediate various actions of cannabinoids. Through these receptors, cannabinoids inhibit the proliferation and invasion of GBM cells, along with changing their morphology. Cannabinoids also induce an intrinsic pathway of apoptosis in the tumor. Hence the use of cannabinoids in the treatment of GBM may be beneficial to the patients. So far, studies focusing on using cannabinoids in GBM therapy are mainly preclinical and involve cell lines and mice. The results are promising and show cannabinoids inhibit GBM growth. Several clinical studies are also being carried out. The preliminary results show good tolerance of cannabinoids and prolonged survival after administration of these drugs. In this review, we describe the impact of cannabinoids on GBM and glioma cells in vitro and in animal studies. We also provide overview of clinical trials on using cannabinoids in the treatment of GBM.

Keywords: Cancer; Cannabinoids medical use; Glioblastoma.

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