Tamoxifen

Tamoxifen, a selective estrogen receptor modulator, is widely used in the chemotherapy of estrogen receptor-positive breast cancer.

Studies have indicated that tamoxifen might have a potential chemotherapeutic effect on glioma.

The combinatorial administration of tamoxifen and TMZ appeared to be well-tolerated, and potentially effective in increasing the efficacy of dose-dense temozolomide (TMZ) schedule as a second-line therapeutic strategy [1].

In the a study, He et al. determined the chemotherapeutic action of tamoxifen on human glioma cell lines. Methylation of 06-methylguanine-DNA methyltransferase was identified in A172, U251, and BT325 glioma cell lines, but not in the U87 cell line. Consistently, A172, U251, and BT325 cell lines are resistant to temozolomide. Tamoxifen induced significant cytotoxic action in A172, U251, BT325, and U87 cell lines. Further, Hoechst 33342 staining and apoptosis flow cytometric analysis demonstrated that tamoxifen induced apoptosis in the BT325 cell line. Mitochondrial complex analysis indicated that tamoxifen, but not other estrogen receptor modulators, dose-dependently inhibits complex I activity.

In summary, tamoxifen might have a chemotherapeutic effect on temozolomide-resistant glioma through its direct action on mitochondrial complex I inhibition and could provide further evidence to support future clinical trials of tamoxifen for the treatment of glioblastoma [2].

Solid lipid nanoparticles (SLNs) conjugated with tamoxifen (TX) and lactoferrin (Lf) were applied to carry anticancer carmustine (BCNU) across the blood-brain barrier (BBB) for enhanced antiproliferation against glioblastoma multiforme (GBM). BCNU-loaded SLNs with modified TX and Lf (TX-Lf-BCNU-SLNs) were used to penetrate a monolayer of human brain-microvascular endothelial cells (HBMECs) and human astrocytes and to target malignant U87MG cells. The surface TX and Lf on TX-Lf-BCNU-SLNs improved the characteristics of sustained release for BCNU. When compared with BCNU-loaded SLNs, TX-Lf-BCNU-SLNs increased the BBB permeability coefficient for BCNU about ten times. In addition, TX-BCNU-SLNs considerably promoted the fluorescent intensity of intracellular acetomethoxy derivative of calcein (calcein-AM) in HBMECs via endocytosis. However, the conjugated Lf could only slightly increase the fluorescence of calcein-AM. Moreover, the order of formulation in the inhibition to U87MG cells was TX-Lf-BCNU-SLNs>TX-BCNU-SLNs>Lf-BCNU-SLNs>BCNU-SLNs. TX-Lf-BCNU-SLNs can be effective in infiltrating the BBB and delivering BCNU to GBM for future chemotherapy application [3]

1)
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