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Study of Glioma Tumor and Diagnosis Process

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DESCRIPTION

Tumours of the brain and spinal cord are known as gliomas. Gliomas begin in the glial cells, which are the gluey supporting cells that help nerve cells function. Tumors can be produced by three types of glial cells. Gliomas are categorized according to the type of glial cell that is involved in the tumor as well as the genetic characteristics of the tumor. These characteristics can assist in predicting how the tumor will behave over time and the treatments that are most likely to be effective. Glioma risk is increased by germ-line (inherited) polymorphisms in the DNA repair genes ERCC1, ERCC2 (XPD), and XRCC1. This suggests that gliomas arise as a result of defective or altered DNA damage repair. Damages to DNA are probably a big part of how cancer grows in general. Through the process of translesion synthesis, excessive DNA damage can result in mutations. Epigenetic changes or epimutations can also result from incomplete DNA repair. A cell may gain a proliferative advantage through these mutations and epimutations, which can then cause cancer through natural selection. An assortment of 32 gliomas showed epigenetic reductions in the expression of another DNA repair protein, ERCC1. The expression of the ERCC1 protein was either reduced or absent in 17 of the 32 gliomas examined, or 53%. Methylation of the ERCC1 promoter was the cause of this reduction in 12 gliomas (37.5% of the cases). The reduction in ERCC1 protein expression in the remaining 5 gliomas may have been caused by epigenetic changes in microRNAs that regulate ERCC1 expression. In glioblastomas without methylated MGMT promoters, increased levels of a microRNA that inhibits the ability of the MGMT messenger RNA to produce the MGMT protein are found. The level of the microRNA miR-181d is inversely correlated with the protein expression of MGMT, and the MGMT mRNA 3'UTR the three prime untranslated regions of the MGMT messenger RNA-is the direct target of miR-181d. In the development of sporadic glioblastoma, epigenetic repression of DNA repair genes is frequently observed. For instance, DNA repair gene MGMT promoter methylation was found in 51% to 66% of glioblastoma samples. Another kind of epigenetic change causes the MGMT protein to be deficient in some glioblastomas. Rare tumors of the brain stem are known as brain stem gliomas (also known as DIPGs or diffuse infiltrating brainstem gliomas). Because of their remote location, where they intertwine with normal brain tissue and affect the delicate and complex functions this area controls, they typically cannot be removed surgically. These tumors are most common in school-aged children, who account for the greatest number of primary brain tumor-related deaths in children. A glioma is a tumor that grows out of control when glial cells are present. These cells normally support nerves and aid the functioning of your central nervous system. Typically, gliomas develop in the brain, but they can also develop in the spinal cord. The brain stem glioma is extremely uncommon. The lowest part of the brain that connects to the spinal cord is called the brain stem. It regulates bodily functions like breathing that we rarely consider.

Gliomas of the brain stem are more prevalent in children than in adults. They grow quickly and spread to other parts of the brain in some children. Children's brain stem gliomas are also known as diffuse intrinsic pontine glioma.

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CONFLICT OF INTEREST

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