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Glioblastoma and the significance of MGMT gene methylation

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ABSTRACT

In this research Glioblastoma has been studied as one of the most common brain tumors and a short review of the available therapeutic methods have presented including surgery, radiotherapy, chemotherapy and particularly adjuvant chemotherapy with temozolomide, as the most effective developed treatment. Moreover, MGMT gene promoter methylation has been introduced as an important predictive factor of treatment response to temozolamide. The different mechanisms of methylation and the available literature on its association with patient survival and disease recurrence have been summarized. Taken together, Glioblastoma is a tumor in which the MGMT gene expression can potentially deliver the highest amount of data in comparison to other tumors; as almost every related study has emphasized on the direct association between MGMT methylation and patient survival. Regarding this debate, the pseudoprogression pattern in Glioblastoma patients and the laboratory methods studying MGMT gene methylation have been examined. At the end of this review, the obstacles to its development have been briefly mentioned.

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Introduction

Glioblastoma accounts for 75% of malignant glial tumors of the brain. This tumor is the most common primary brain tumor in adults, which has poor prognosis and high mortality rate despite different surgical, chemotherapy and radiotherapy modalities, which occurs in most patients in less than two years from diagnosis. Histologically these tumors are characterized by high cellular proliferation, formation of small blood vessels and local necrosis (1).

Today, the standard treatments applied for GB patients include the use of utmost surgical resection (2) chemoradiotherapy

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