Personalized treatment strategies in glioblastoma: MGMT promoter methylation status.

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Abstract
The identification of molecular genetic biomarkers considerably increased our current understanding of glioma genesis, prognostic evaluation, and treatment planning. In glioblastoma, the most malignant intrinsic brain tumor entity in adults, the promoter methylation status of the gene encoding for the repair enzyme O6-methylguanine-DNA methyltransferase (MGMT) indicates increased efficacy of current standard of care, which is concomitant and adjuvant chemoradiotherapy with the alkylating agent temozolomide. In the elderly, MGMT promoter methylation status has recently been introduced to be a predictive biomarker that can be used for stratification of treatment regimes. This review gives a short summery of epidemiological, clinical, diagnostic, and treatment aspects of patients who are currently diagnosed with glioblastoma. The most important molecular genetic markers and epigenetic alterations in glioblastoma are summarized. Special focus is given to the physiological function of DNA methylation-in particular, of the MGMT gene promoter, its clinical relevance, technical aspects of status assessment, its correlation with MGMT mRNA and protein expressions, and its place within the management cascade of glioblastoma patients.

KEYWORDS: MGMT, glioblastoma, outcome, personalized treatment, temozolomide

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