Spinal cord stimulation as adjuvant during chemotherapy and reirradiation treatment of recurrent high-grade gliomas.


Abstract

Aims. Relapsed high-grade gliomas (HGGs) have poor prognoses and there is no standard treatment. HGGs have ischemia/hypoxia associated and, as such, drugs and oxygen have low access, with increased resistance to chemotherapy and radiotherapy. Tumor hypoxia modification can improve outcomes and overall survival in some patients with these tumors. In previous works, we have described that cervical spinal cord stimulation can modify tumor microenvironment in HGG by increasing tumor blood flow, oxygenation, and metabolism. The aim of this current, preliminary, nonrandomized, study was to assess the clinical effect of spinal cord stimulation during brain reirradiation and chemotherapy deployed for the treatment of recurrent HGG; the hypothesis being that an improvement in oxygenated blood supply would facilitate enhanced delivery of the scheduled therapy. Materials and methods. Seven patients had spinal cord stimulation applied during the scheduled reirradiation and chemotherapy for the treatment of recurrent HGG (6 anaplastic gliomas and 1 glioblastoma). Median dose of previous irradiation was 60 Gy (range = 56-72 Gy) and median dose of reirradiation was 46 Gy (range = 40-46 Gy). Primary end point of the study was overall survival (OS) following confirmation of HGG relapse. Results. From the time of diagnosis of last tumor relapse before reirradiation, median OS was 39 months (95% CI = 0-93) for the overall study group; 39 months (95% CI = 9-69) for those with anaplastic gliomas and 16 months for the patient with glioblastoma. Posttreatment, doses of corticosteroids was significantly decreased (P = .026) and performance status significantly improved (P = .046). Conclusions. Spinal cord stimulation during reirradiation and chemotherapy is feasible and well tolerated. In our study, spinal cord stimulation was associated with clinical improvement and longer survival than previously reported in recurrent anaplastic gliomas. Spinal cord stimulation as adjuvant during chemotherapy and reirradiation in relapsed HGGs merits further research.

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KEYWORDS: EQD2; anaplastic astrocytoma; complementary treatment; glioblastoma; reirradiation; relapsed brain tumor; spinal cord stimulation; temozolomide
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