Temporal relationship of post-operative radiotherapy with temozolomide and oncologic outcome for glioblastoma.

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Abstract

To determine the impact of delay between surgery and radiotherapy on overall survival (OS) in temozolomide treated patients with the incorporation of O6-methylguanine-DNA methyltransferase (MGMT). From 2000 to 2012, 345 consecutive glioblastoma patients were treated with surgery, radiotherapy, and temozolomide at our institution. A Cox-regression model was constructed using significant univariate parameters, known prognostic factors including MGMT, and the interval from surgery to radiotherapy (≤2, 2-5, and ≥6 weeks). Survival rates were calculated by Kaplan-Meier methods. Cox-regression was utilized to calculate adjusted hazard ratios (HR). The median survival for the entire cohort was 12.2 months. The 1 year actuarial OS was 43.1 %, 53.3 %, and 64.3 % (p = 0.11), for intervals from surgery to radiotherapy of ≤2, 2-5, and ≥6 weeks, respectively. Patients radiated within 2 weeks post-surgery were more likely to have older age (p = 0.03), treated with 2D techniques (p < 0.001) and dose <36 Gy (p < 0.001), undergo a biopsy only (p < 0.001), KPS of <70 (p < 0.001), severe pre-radiotherapy neurologic symptoms (p = 0.04), and bilateral disease (p = 0.02). Multivariate analysis including MGMT status demonstrated a significant detriment in delaying radiotherapy (≤2 weeks as reference); 3-5 weeks (HR 2.80 [0.72-10.89], p = 0.14), and >6 weeks (HR 3.76 [1.01-14.57], p = 0.05). We report the first analysis on the survival impact of delaying post-operative radiotherapy for temozolomide treated glioblastoma patients with MGMT information. Our data does not support the OS benefit previously seen in delayed RT when correcting for important covariates. We demonstrate a survival detriment with delaying RT post-surgery greater than 6 weeks on multivariate analysis.

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