Rad51 protein expression and survival in patients with glioblastoma multiforme.

Welsh JW, Ellsworth RK, Kumar R, Fjerstad K, Martinez J, Nagel RB, Eschbacher J, Stea B.

Department of Radiation Oncology, University of Arizona College of Medicine, Tucson, AZ, USA.

PURPOSE: Treatment of glioblastoma multiforme (GBM) continues to pose a significant therapeutic challenge, with most tumors recurring within the previously irradiated tumor bed. To improve outcomes, we must be able to identify and treat resistant cell populations. Rad51, an enzyme involved in homologous recombinational repair, leads to increased resistance of tumor cells to cytotoxic treatments such as radiotherapy. We hypothesized that Rad51 might contribute to GBM's apparent radioresistance and consequently influence survival.

METHODS AND MATERIALS: A total of 68 patients with an initial diagnosis of GBM were retrospectively evaluated; for 10 of these patients, recurrent tumor specimens were used to construct a tissue microarray. Rad51 protein expression was then correlated with the actual and predicted survival using recursive partitioning analysis. RESULTS: Rad51 protein was elevated in 53% of the GBM specimens at surgery. The Rad51 levels correlated directly with survival, with a median survival of 15 months for patients with elevated Rad51 compared with 9 months for patients with low or absent levels of Rad51 (p = .05). At disease recurrence, 70% of patients had additional increases in Rad51 protein. Increased Rad51 levels at disease recurrence similarly predicted for improved overall survival, with a mean survival of 16 months from the second craniotomy compared with only 4 months for patients with low Rad51 levels (p = .13). CONCLUSION: Elevated levels of the double-stranded DNA repair protein Rad51 predicted for an increase survival duration in patients with GBM, at both initial tumor presentation and disease recurrence.

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