FDG PET/MR Imaging Coregistration Helps Predict Survival in Patients with Glioblastoma and Radiologic Progression after Standard of Care Treatment.

Leiva-Salinas C¹, Schiff D¹, Flors L¹, Patrie JT¹, Rehm PK¹.

Abstract

Purpose To determine the correlation between metabolic activity at fluorine 18 fluorodeoxyglucose (FDG) positron emission tomography (PET) and survival in patients with glioblastoma and suspected progression at posttherapy magnetic resonance (MR) imaging.

Materials and Methods The authors retrospectively examined the relationship between metabolic activity at FDG PET in the residual lesion identified at brain MR imaging and survival time in 56 patients with glioblastoma who were treated with postoperative concurrent radiation and temozolomide therapy and who underwent FDG PET/computed tomography because of radiologic deterioration at follow-up MR imaging between 2006 and 2015. A normalized metric of metabolic activity in the residual lesion (standardized uptake value ratio [SUVₘᵩₙ]) was calculated as the maximum standardized uptake value (SUVₘₐₓ) in the tumor relative to that in healthy white matter. The primary end point of the study was survival time from PET. Patients were stratified according to SUVₘᵩₙ. Comparisons of risk for death between subgroups were made with the log-hazard ratio of the Cox proportional hazard model. Results There was a significant association between overall survival and SUVₘᵩₙ in the residual lesion (P = .006), and a survival benefit was observed in patients with SUVₘᵩₙ of less than 1.7, who had a median survival time of 23.1 months (95% confidence interval [CI]: 12.7, 38.9), which was significantly longer than that in patients with an SUVₘᵩₙ of 2.0 to less than 2.5 and those with an SUVₘᵩₙ of at least 2.5, who had a median survival time of 10.1 (95% CI: 2.4, 15.9; P = .008) and 7.5 (95% CI: 3.9, 9.7; P < .001) months, respectively. Conclusion Patients with glioblastoma whose posttherapy MR images showed a residual lesion with high relative metabolic activity at FDG PET had a shorter survival time than did those with low activity at FDG PET. © RSNA, 2016.

PMID: 28234553 DOI: 10.1148/radiol.2016161172

[PubMed - as supplied by publisher]