Abstract

PURPOSE: To evaluate the incidence of leukoencephalopathy after whole-brain radiation therapy (WBRT) in patients with brain metastases.

METHODS AND MATERIALS: We retrospectively reviewed 111 patients who underwent WBRT for brain metastases from April 2001 through March 2008 and had evaluable computed tomography (CT) and/or magnetic resonance imaging (MRI) at least 1 month after completion of WBRT. We evaluated the leukoencephalopathy according to the Common Terminology Criteria for Adverse Events, version 3.0. The patients who had brain tumor recurrence after WBRT were censored at the last follow-up CT or MRI without recurrence. To evaluate the risk factors for leukoencephalopathy, bivariate analysis was performed using a logistic regression analysis adjusted for follow-up time. Factors included in the analysis were age, gender, dose fractionation, 5-fluorouracil, methotrexate, cisplatin, and other chemotherapeutic agents.

RESULTS: The median age of the 111 patients was 60.0 years (range, 23-89 years). The median follow-up was 3.8 months (range, 1.0-38.1 months). Leukoencephalopathy developed in 23 of the 111 patients. Grades 1, 2, and 3 were observed in 8, 7, and 8 patients, respectively. The incidence was 34.4% (11 of 32), 42.9% (6 of 14), 66.7% (2 of 3), and 100% (2 of 2) of the patients who were followed up for ≥6, ≥12, ≥24, and ≥36 months, respectively. In the bivariate analysis, older age (≥65 years) was significantly correlated with higher risk of leukoencephalopathy (odds ratio 3.31; 95% confidence interval 1.15-9.50; P=.03).

CONCLUSIONS: The incidence of leukoencephalopathy after WBRT was 34.4% with ≥6 months follow-up, and increased with longer follow-up. Older age was a significant risk factor. The schedule of WBRT for patients with brain metastases should be carefully determined, especially for favorable patients.

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