

CLINICAL PAPER /

BRAIN TUMOR



The Value of 4-Month Neurocognitive Function as an Endpoint in Brain Metastases Trials.

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ABSTRACT

To investigate whether the neurocognitive function at 4 months could be a relevant primary endpoint in clinical trials dealing with brain metastases, we created a Japanese neurocognitive battery and examined the changes in patients' neurocognitive function for 1 year after their brain radiotherapy. In this prospective pilot study, we enrolled 27 patients (20 patients who received whole-brain radiation therapy [WBRT] and seven who received stereotactic irradiation [STI] alone) between March 2009 and December 2010. The follow-up neurocognitive data at 4, 8 and 12 months were available in 22 (17 WBRT, 5 STI), 19 patients (14 WBRT, 5 STI) and 13 patients (9 WBRT, 4 STI), respectively. Among the patients who received WBRT, significant deterioration in delayed memory compared to the baseline ($p = 0.04$) was observed at 4 months, and at 8 months, significant improvements were observed in immediate memory compared to the baseline ($p = 0.008$) and 4-months scores ($p = 0.005$). At 12 months, however, the immediate memory scores

had returned to the baseline. Similar trends were observed in other functions (delayed memory, attention and executive functions). In these patients, the correlations between 4-months scores of neurocognitive functions and 12-months scores were significant in immediate memory ($\gamma = 0.68$, $p = 0.004$), delayed memory ($\gamma = 0.738$, $p = 0.023$) and attention ($\gamma = 0.817$, $p = 0.007$). Among the patients who received STI, no significant changes were observed in any functions. These results suggest that 4-months changes in neurocognitive functions were transient but could also be a premonitory index for predicting the neurocognitive function 1 year or later after brain radiation therapy.