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Abstract
An investigation of boron neutron capture therapy for recurrent glioblastoma multiforme

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Abstract

Objectives – To explore the use of boron neutron capture therapy (BNCT) for patients with glioblastoma multiforme (GBM), recurring after surgery and conventional radiotherapy (photon radiotherapy).

Materials and methods – Boron uptake in recurrent GBM was measured for four patients. Twelve patients were subsequently treated by BNCT with boronophenylalanine-fructose (900 mg/kg body weight), administered by intravenous infusion for 6 h.

Results – Median survival time from initial diagnosis was 22.2 months. Comparison with other BNCT studies indicates a clinical advantage of the prolonged infusion. BNCT was well tolerated and quality of life remained stable until tumor progression for all 12 patients. No correlation was found between survival times and minimum tumor dose and number of radiation fields.

Conclusions – Boron neutron capture therapy, with the prolonged procedure for infusion, is at least as effective as other

radiation therapies for recurrent GBM and is delivered in one treatment session, with low radiation dose to the healthy brain. Survival from diagnosis compares favorably with that obtained with conventional radiotherapy plus concomitant and adjuvant temozolomide (TMZ) and survival from recurrence compares favorably with that obtained with TMZ at first relapse. The results of the present investigation are encouraging and should be confirmed in a randomized trial.

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