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Brain imaging findings in symptomatic patients after allogeneic haematopoietic stem cell transplantation: Correlation with clinical outcome

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Objective: To investigate the risk factors for, and the incidence of, structural abnormalities on brain imaging in allogeneic haematopoietic stem cell transplant (HSCT) patients, and correlate these findings with survival.

Methods: We retrospectively reviewed all brain computed tomography (CT) and/or magnetic resonance imaging (MRI) studies obtained during the first post-HSCT year from 2004 thru 2007 in allogeneic HSCT recipients.

Results: A total of 128 patients had brain imaging in the first post-HSCT year. Forty one of these 128 patients (32 %) had structural abnormalities on brain imaging: cerebrovascular complications (n = 10), central nervous system (CNS) infection (n = 9), subdural fluid collection (n = 6), CNS recurrence of haematological malignancy (n = 11), and drug toxicity abnormalities (n = 5). The only significant risk factor for structural imaging abnormality was younger patient age ($P = 0.01$). MRI was significantly more likely than CT to provide specific imaging diagnosis of cerebral lesions ($P = 0.001$). HSCT patients with cerebrovascular complications have poor survival ($P < 0.05$). However, overall survival was not significantly worse for the 41 patients with the structural imaging abnormalities as compared to the 87 patients who had brain imaging but no structural abnormalities.

Conclusions: There was no survival difference in patients whose brain imaging was normal or abnormal. However, there was poor outcome in patients with cerebrovascular complications after HSCT.

Key Points: • Brain imaging frequently demonstrates neurological complications following haematopoietic stem cell transplantation. • Younger HSCT patients are more likely to exhibit abnormal brain imaging findings. • HSCT recipients with cerebrovascular complications have the worst survival. • However brain imaging results are weak indicators of overall survival after HSCT.