25-Year Study of Lung Fibrosis Following Carmustine Therapy for Brain Tumor in Childhood

To the Editor:

Our group in Manchester, UK, previously reported the existence of active and progressive lung fibrosis in patients up to 20 years after undergoing chemotherapy with high-dose carmustine therapy for brain tumors in childhood.1,2 We now present follow-up data for these patients up to 25 years from the date of carmustine treatment (mean time, 23 years; range, 18 to 25 years).

Nine of 17 brain tumor survivors (53%) have died of pulmonary fibrosis. Two survivors (12%) died within the first 3 years after undergoing chemotherapy, four more died between 6 and 13 years after treatment, and another three have died since then (i.e., 13 to 25 years after treatment). Patients who were treated at an earlier age seemed to be at greater risk of developing pulmonary fibrosis. Of the eight patients still alive, we have follow-up data for seven, and they all have radiologic and physiologic (i.e., lung function) evidence of upper zone pulmonary fibrosis. These patients have been followed up with serial lung function data at the North West Lung Centre at Wythenshawe Hospital, as presented in Figure 1 (which includes the lung function data of two other patients who received follow-up treatment and survived the first 13 years following treatment but have died since then). Three of the patients have had stable lung function for >2 decades, but the rest have slowly progressive restrictive defects.

Patients to whom carmustine was given in childhood developed an unusual progressive upper zone fibrosis. This model continues to give insight into progressive pulmonary fibrosis in which an early transient insult results in progressive pulmonary fibrosis. The rate of progression depends on the severity and timing of the insult, and probably on genetic profibrotic factors.

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References

Figure 1. Serial FVC measurements of the study patients.