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Hematopoietic Stem-Cell Transplantation for Systemic Lupus Erythematosus

TO THE EDITOR:

A 24-year-old woman received the diagnosis of systemic lupus erythematosus at 11 years of age. Since then, she has had episodic flares characterized by fatigue, fever, malar rash, arthralgias, abdominal pain, and lupus nephritis. Dialysis and mechanical ventilation have been required intermittently, and she has been treated with plasmapheresis, corticosteroids, hydroxychloroquine, methotrexate, azathioprine, and cyclophosphamide, none of which allowed a tapering of prednisone to a dose of less than 20 mg a day. Since the age of 11 years, her hemoglobin level has ranged from 6.5 to 7.2 mg per deciliter (4.0 to 4.5 mmol per liter), her white-cell count has ranged from 2000 to 2400 per cubic millimeter, and her platelet count has been approximately 100,000 per cubic millimeter. Assays of C3, antinuclear antibodies, and anti–double-stranded DNA antibodies have never had normal results, even during clinical remissions. Table 1. Laboratory Values before and after Stem-Cell Transplantation.

At the age of 23 years, biopsy-proven, World Health Organization class IV glomerulonephritis developed. After the patient had undergone five monthly courses of cyclophosphamide (500 mg per square meter of body-surface area), her serum creatinine level stabilized at 1.8 mg per deciliter. Within two months of the completion of cyclophosphamide therapy, active lupus recurred, with a malar rash, arthralgias, hematuria, proteinuria, rapidly deteriorating renal function, diffuse abdominal pain, ascites, and a large pericardial effusion (Table 1).

The patient was enrolled in a study of autologous hematopoietic stem-cell transplantation approved by the Northwestern University institutional review board and the Food and Drug Administration. Hematopoietic stem cells were mobilized with cyclophosphamide (2.0 g per square meter) and granulocyte colony-stimulating factor (10 μg per kilogram of body weight per day), enriched ex vivo with the use of CD34-positive–cell selection with the CellPro Ceprate column, and reinfused after maximal immunosuppression with cyclophosphamide (200 mg per kilogram) and antithymocyte globulin (90 mg per kilogram). Hematopoietic-cell engraftment occurred, with an absolute neutrophil count of more than 500 per cubic millimeter and a platelet count of more than 20,000 per cubic millimeter measured on day 10 and day 14, respectively. In the six months since undergoing hematopoietic stem-cell transplantation, the patient has remained in remission, as indicated by clinical and laboratory factors (Table 1), despite the gradual discontinuation of immunosuppressive medications, including corticosteroids.

Hematopoietic stem-cell transplantation has been suggested as therapy for severe autoimmune diseases.1-3 In this case, autologous T-cell–depleted hematopoietic stem-cell transplantation was used for the treatment of systemic lupus erythematosus. For the first time since the onset of the disease 13 years ago, the patient has been in complete clinical and serologic remission. However, the follow-up has been short (six months), and the durability of the remission is unknown.

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