Acute Leukemia in a Uremic Patient Undergoing Erythropoietin Treatment

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Dear Sir,

Erythropoietin (EPO) has been shown to be an excellent drug to reverse anemia in uremia with few adverse effects. We describe 1 case of leukemia developing during EPO treatment in a uremic patient.

In July 1995, we observed a 74-year-old man affected by end-stage renal failure following nephroangiosclerosis on maintenance hemodialysis since January 1993. The patient had a good clinical status except for a persistent anemia: hemoglobin was 7.1 g/dl, hematocrit 20.9%, white blood cell count $6.1 \times 10^9/\mu\text{l}$, platelet count $221.0 \times 10^3/\mu\text{l}$. EPO treatment (4,000 IU s.c. twice weekly) was started. The hemoglobin value improved after 18 days and became stable, at 8.2 g/dl.

Seven weeks after EPO therapy, the patient complained of fever, dyspnea, weakness and leukocytosis. Subsequent laboratory and clinical features showed a picture of acute lymphocytic leukemia (ALL). One month later the patient died during chemotherapy.

Campistrus et al. [1] observed acute non-lymphocytic leukemia (ANLL) in a uremic patient in hemodialysis treated with EPO. Uyttebroeck et al. [2] described a transformation to acute myelomonocytic leukemia in a child affected by 5q-syndrome after EPO treatment. Both authors did not exclude that extramedullary hematopoiesis with secondary transformation to leukemia stimulated by EPO occurred.

Furthermore the development of acute leukemia was observed in 3/14 patients with myelodysplastic syndromes while on EPO therapy [3]. There is evidence that EPO in vitro can stimulate ANLL blast cells [4]. At present, EPO is employed in anemia associated with all hematologic malignancies and solid tumors except acute myeloid leukemia. An interesting study suggests that in both murine and human systems genetic alterations of the EPO receptor gene are not rare events and could be involved in the occurrence of the erythroleukemic process [5].

We observed 1 case of ALL in a uremic patient and no references have been found on ALL after EPO treatment. It is possible that the anemia was a symptom of a preleukemic state. Further investigations are

needed in order to clarify whether EPO increases the potential risk of transformation to acute leukemia. Careful use of EPO is important in particular in uremic patients, because the anemia is not always a renal symptom.

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