Erythrophagocytosis by leukemic blasts in acute myeloid leukemia with a normal karyotype and no detectable mutations

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ABSTRACT

The phagocytosis of erythrocytes by leukemic blasts is a rare finding in acute myeloid leukemia and has been reported most commonly in monocytic and megakaryocytic morphologies. In the reported cases, erythrophagocytosis by leukemic blasts has been associated with t(8;16). This translocation is associated with a poor outcome independent of erythrophagocytosis. There has only been one reported case of erythrophagocytosis by leukemic blasts occurring in a patient with a normal karyotype. We report a 62-year-old woman with acute myeloid leukemia with monocytic features and a normal karyotype noted to have erythrophagocytosis by leukemic blasts.

KEYWORDS Acute myeloid leukemia; erythrophagocytosis; leukemic blasts

Erythrophagocytosis by leukemic blasts is a rare but previously reported finding in monocytic and megakaryocytic subtypes of acute myeloid leukemia (AML). This finding is typically associated with t(8;16)(p11;q13), which portends a poor prognosis; however, it has also been reported in association with t(16;21)(p11;q22), inv8(p11q13), and tetraploidy and has been reported in one case with a normal karyotype.^{1,2} We report the second case of AML with monocytic features and a normal karyotype exhibiting erythrophagocytosis by leukemic blasts.

CASE REPORT

A 62-year-old woman with known systemic lupus erythematosus presented with weakness, fatigue, dyspnea, chills, dizziness, bleeding gums, epistaxis, and ankle swelling. She previously received chemoradiation therapy for small cell lung cancer. A complete blood count revealed normochromic, normocytic anemia with a hemoglobin of 8.0 g/dL, thrombocytopenia with a platelet count of $27 \times 10^9/L$, and a leukocytosis of $14.76 \times 10^9/L$ with 43% circulating blasts. A bone marrow biopsy showed approximately 85% monoblasts with prominent erythrophagocytic activity by leukemic

blasts and blast equivalents (*Figure 1*). A final diagnosis of AML with monocytic features was given.

Flow cytometry identified a discrete blast population by CD45 vs side scatter comprising 87% of the nonerythroid marrow elements. The blasts were negative for CD34 and CD117 and expressed bright HLA-DR, CD38, CD33, CD14, CD4, CD64, and CD25 with dim positivity for CD13, CD16, CD123, and cMPO, indicating monocytic

Figure 1. (a) Bone marrow aspirate smear depicting erythrophagocytosis by leukemic myeloid blasts (black arrows; Wright-Giemsa stain, original magnification $\times 500$ oil immersion). (b) Bone marrow biopsy showing enlarged leukemic myeloid blasts with prominent nucleoli and chromocenters. Erythrophagocytosis by blasts can also be seen on the hematoxylin and eosin-stained sections (black arrow; original magnification $\times 500$ oil immersion).

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lineage. There was no evidence of B-cell light chain restriction or an aberrant T-cell immunophenotype. Cytogenetics and molecular analyses revealed a normal 46,XX karyotype and no detectable mutations.

The patient was started on 7 + 3 induction chemotherapy consisting of 200 mg intravenous infusion of cytarabine with 120 mg intravenous daunorubicin. She completed her therapy regimen without achieving remission and remained hospitalized for neutropenic fever, pneumonia, acute-onset heart failure, and transaminitis. She has a poor prognosis because she is not a candidate for bone marrow transplant.

DISCUSSION

Erythrophagocytosis by leukemic blasts has been reported in rare cases of AML with monocytic/monoblastic and megakaryocytic morphologies as well as in rare cases of acute lymphoblastic leukemia.^{1,3,4} These variants of AML are most often associated with t(8;16), although other chromosomal abnormalities have also been reported.⁵ The exact pathogenesis of erythrophagocytosis by leukemic blasts is unknown, as is the clinical significance; however, this finding has been reported most commonly in association with t(8;16), which portends a poor prognosis independent of erythrophagocytosis.⁶

The prognosis of erythrophagocytosis by leukemic blasts in AML with a normal karyotype is unknown. Only one other case has been reported to date in a 39-year-old woman with AML with monocytic differentiation.² In this case, her leukemia was refractory to multiple rounds of chemotherapy and she was subsequently transferred to hospice 8 months after the initial diagnosis. We report the second case of AML with monocytic features with prominent erythrophagocytosis by leukemic blasts with unremarkable cytogenetics and

molecular testing. Like the first case report, she has not achieved remission and has a poor prognosis. These two case reports suggest that erythrophagocytosis by leukemic blasts is an independent poor prognostic indicator and that these cases may be refractory to current induction chemotherapy regimens. Continued case reports and studies on such patients may provide more insight.

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