Clinical and laboratory findings

A 54-year-old man was admitted because of fatigue, headache, dyspnea and fever. At physical examination pallor, cutaneous purpura on both legs, hepatomegaly and splenomegaly were found.

A blood count showed anemia (Hb 9.4 g/dL), thrombocytopenia (P 23 × 10^9/L) and leukopenia (WBC 2 × 10^9/L) with 18% neutrophils, 8% eosinophils, 55% lymphocytes, 2% monocytes, 3% eosinophilic metamyelocytes, 2% eosinophilic myelocytes and 9% blasts. Bone marrow was hypercellular with a monomorphic picture; there were 70% blasts.

Morphology

At low magnification blast cells showed an unusual greyish staining of the cytoplasm; at higher magnification they presented eccentric nucleolated nuclei, low N-C ratio, abundant cytoplasm containing granular grey material, located inside and around the Golgi area and often superimposed on the nucleus (Figure 1). In some blasts large vacuolar structures, sometimes including granules, were present (Figure 2, 3). A few cells were maturing and showed evidence of eosinophilic differentiation with anomalous staining of granules. Megakaryocytes and erythroid cells did not show dysplastic features.
Cytochemistry
Blasts were PAS and non-specific esterase negative, strongly positive to Sudan black and peroxidase reactions, peroxidase activity being cyanide-resistant; most cells were positive also to chloro-acetate-esterase.
**Electron microscopy**

In the majority of the cells nuclei had diffuse chromatin and prominent nucleoli. In the cytoplasm there were numerous dilated cisterna of the endoplasmic reticulum, prominent Golgi zone and membrane-limited granules of different sizes filled with heterogeneous electron-dense material (Figure 4). In some cells also large vacuoles partially filled with flocculent electron-dense material were evident (Figure 5). Granules with crystalline cores were seen only in mature cells.

**Immunophenotype**

Leukemic cells were CD13 and CD33 positive, CD14 negative, TdT negative and negative to other lymphoid markers.

**Cytogenetics**

Cytogenetic study showed a normal karyotype.

**Conclusions**

As cyanide-resistant-peroxidase positivity is specific for eosinophilic cells,\(^1\,^2\) a diagnosis of acute nonlymphocytic leukemia (ANLL) (M2) with eosinophilic differentiation was made.

*De novo* acute eosinophilic leukemia or eosinophilblastic leukemia is a distinct entity, very rare, difficult to recognize and often misdiagnosed.\(^3\) It is characterized by blasts or promyelocytes maturing toward the eosinophil lineage, with anomalous staining properties, that usually can be identified only by cytochemical studies; they may present the same cytogenetic abnormalities as other ANLL subtypes. This variant has to be differentiated from other forms of ANLL with marrow hypereosinophilia, such as M2Eo and M4Eo, characterized by specific chromosome anomalies.\(^4\)

The main clinical features of acute eosinophilic leukemia are hepatomegaly, splenomegaly, possible bronchospastic signs and heart failure. Response to treatment, however, as well as prognosis, is the same as in other types of ANLL.

**References**