Atypical chronic myeloid leukemia (aCML)
Jesus M Hernandez, Norma C Gutierrez, Juan L Garcia

Identity

Note
The nosology of aCML is controversial. The FAB classification includes aCML in the group of chronic myeloid leukemias. Recently the WHO classification has classified aCML in the group of myelodysplastic/myeloproliferative diseases.

Clinics and pathology

Disease
aCML is a chronic myeloproliferative disorder with a clinical and hematologic picture similar to chronic myelogenous leukemia (CML) but lacking Philadelphia chromosome and BCR-ABL rearrangement. Atypical CML is characterized by the combination of: 10-20% of immature granulocytes; marked granulocytic dysplasia and both less than 2% of basophils and less than 10% of monocytes.

Phenotype/cell stem origin
Presumably a multipotential stem cell.

Epidemiology
aCML is a disorder of old adults. No predominance of sex. The incidence is not yet established.

Clinics

Cytology
Peripheral blood: Leukocytosis with an high count of immature granulocytes. By definition monocytes are less than 10% and basophils less than 2%. Anemia is more frequent than thrombocytopenia. Bone marrow: Hypercellular bone marrow with myelodysplastic features of the three series, most marked in granulocytic lineage. Blast cell infiltration ranges from 0% to 10%.

Treatment
Hydroxyurea is indicated, although not curative, in old patients. Complete remission may be achieved after chemotherapy based on anthracyclin and citarabine (an acute myeloblastic leukemia therapy schedule). Allogeneic bone marrow transplantation is curative for those patients who are eligible. Some cases may achieve a complete hematological response after interferon therapy.

Prognosis
The median survival is about 24 months with standart therapy. Some cases have a progression to acute myeloblastic leukemia.

Cytogenetics

Cytogenetics morphological
By definition aCML cases lack in Philadelphia chromosome. Overall 50-65% of patients show cytogenetic abnormalities. The most frequent is +8 (25%). Other changes such as -7 and del(12p) have also been recurrently observed. Other abnormalities are: idic(Xq); del(5q); t(6;8)(p23;q22); -9; del(11q); del(12q); del(15q); del(17p); t(17;20) and add(21q). No specific cytogenetic changes have been associated with aCML. Recently a t(5;10)(q33;q22) has been described in a patient.

Genes involved and proteins

Note
The mechanisms of oncogenesis in aCML remains to be elucidated. In a patient with a t(5;10)(q33;q22) a fusion between the genes PDGFbR, also involved in
the t(5;12)(q33;p13) in the chronic myelomonocytic leukemia, and H4, a gene involved in papillary thyroid carcinoma, has been described.

References


Oscier DG. Atypical chronic myeloid leukaemia, a distinct clinical entity related to the myelodysplastic syndrome? Br J Haematol. 1996 Mar;92(3):582-6


Ma SK, Wan TS, Au WY, Kwong YL, Chan LC. Atypical chronic myeloid leukemia with der(20)(t(17;20)(q13;q13)). Cancer Genet Cytogenet. 1999 Jul 15;112(2):130-3


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