International Journal of Health Sciences and Research
www.ijhsr.org ISSN: 2249-9571

Case Report

Acute Basophilic Leukemia - A Rare Case Report

Patil Nanda[1], Mane Avinash[2], Sarda Sharda[3], Khandelwal Ritvik[3]

[1]Professor, [2]Assistant Professor, [3]Tutor,
Department of Pathology, Krishna Institute of Medical Sciences, Karad, India.

Corresponding Author: Khandelwal Ritvik

Received: 09/10/2015 *Revised: 28/10/2015* *Accepted: 29/10/2015*

ABSTRACT

Acute basophilic myeloid leukemia is a rare entity which results de novo or as a consequence of mutational changes secondary to chemotherapy, radiation therapy or immunosuppressive therapy. Acute basophilic leukemia is extremely rare and fatal. The diagnosis of this entity depends on morphology of blasts, cytochemical, immunophenotypic and electron microscopic features.
We report a case of acute basophilic leukemia in a young female to highlight its rarity and poor prognosis.

Key words: Acute basophilic leukemia, Poor prognosis.

INTRODUCTION

Acute basophilic leukemia is very rare accounting for <1% of AML cases. [(1)] It can occur de novo or as a consequence of mutational changes secondary to chemotherapy, radiation therapy or immunosuppressive therapy. Patients exposed to cytotoxic agents have high risk of developing acute myeloid leukemia (t AML), myelodysplastic syndromes and myeloproliferative neoplasms. [(2)] Acute basophilic leukemia in a 30 yr old female patient treated with chemotherapy for retroperitoneal undifferentiated sarcoma.

CASE REPORT

A 30 yr old woman presented to the Oncology Department of our hospital with chief complaints of pain in the abdomen and generalised weakness. She was a known case of undifferentiated sarcoma of retroperitoneum involving the ovaries and uterus. She received two cycles of chemotherapy (Adriamycin & Daunorubicin) 2 months back. Ultrasonography (USG) and routine CBC were advised.

General examination was carried out; it showed pallor Grade III, clubbing and tense ascites, shifting dullness and fluid thrill was positive.

USG showed marked ascites with moderate hepatosplenomegaly, CBC- HB 6.8gm% TLC- 68,500/cumm, Platelets – 45,000/cumm

Peripheral smear and bone marrow showed blasts >80% showing high N:C ratio with heterogenous chromatin and coarse basophilic granules obscuring the nuclear morphology. Focal differentiation towards basophilic lineage was evident in the form of basophilic myelocyte and band forms. (Fig. 1)

Basophilic granules in the blasts were positive for Toluidine blue stain. (fig 2- B).

Based on these findings, diagnosis of acute basophilic leukemia was given. Patient died on fourth day of admission.

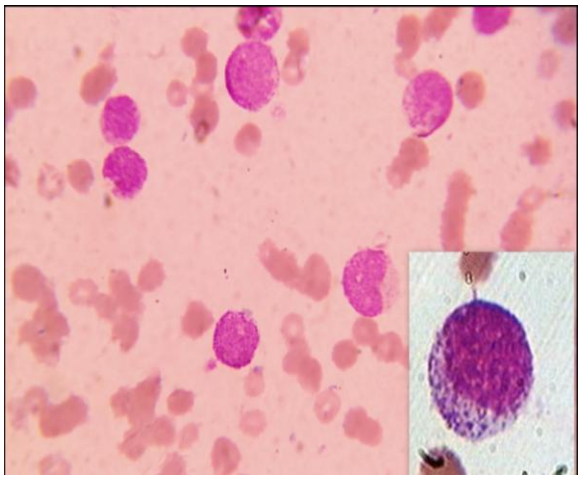

Figure 1: Peripheral smear showing basophils and basophilic precursors (inset) upto blasts. (GMM, 1000X)

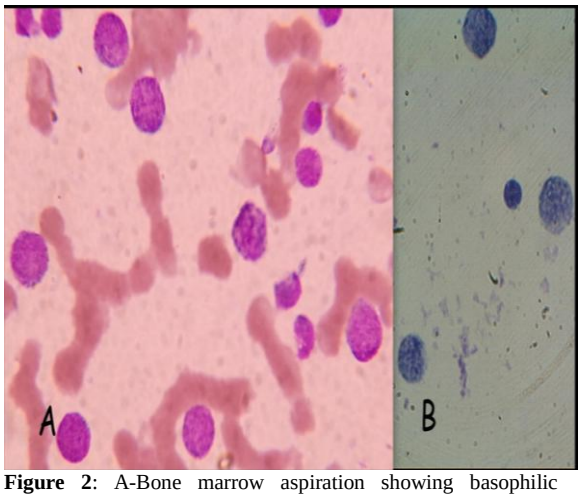

Figure 2: A-Bone marrow aspiration showing basophilic precursors upto blasts (GMM, 1000x). B- Prominent granules in leukemic cells (Toluidine Blue stain, 1000x).

DISCUSSION

Acute basophilic leukemia (ABL) is a poorly described haematological malignancy which accounts for <1% of all myeloid leukemias [(1)] and presents in young adults, basophilic leukemia was first described in 1906 by Jaochin. [(3)] However it was not recognized separately in the FAB classification due to its rare incidence and lack of fixed diagnostic criteria. [(4)] In the recent WHO classification ABL has been recognized as a separate entity as an acute myeloid leukemia in which primary differentiation is to basophils. [(5)] Most cases of basophilic leukemia have been developed from other haematological disorders such as chronic myeloid leukemia (CML) and myelodysplastic syndrome (MDS). [(6,7)]

ABL can be classified into two types. Type I is pure ABL, monophenotypic with basophilic lineage and is classified as AML M8. Few of these cases reveal c-MYB oncogene involvement. Type II shows a mixture of blasts from different lineages with variable proportion of immature and mature basophilic cells. These cases are classified as AML/Baso. [(8)] Our case revealed pure basophilic blasts i.e. Type I (AML M8).

Therapy related myeloid neoplasms account for 10-20% of all cases of AML. The median age at diagnosis is 61 years though patients can present at any age. [(1)] Our case presented at the age of 30 years who was treated with chemotherapy for retroperitoneal undifferentiated sarcoma for two months. The proportion of patients having prior haematological or soft tissue malignancy is equal. [(1)] Therapy related acute myeloid leukemia results from mutational events induced by chemotherapy. Cytogenetic abnormalities in t AML is similar to de novo AML, but additional, unfavourable cytogenetics includes complex karyotype or deletion or loss of chromosome 5 and /or 7. [(9)] In our case, the course of chemotherapy was for a period of two months. Unfortunately the patient did not survive; hence cytogenetic study could not be done to prove its therapy related origin.

Diagnosis of Acute Basophilic Leukemia: Morphological features of leukemic blasts in ABL are moderately basophilic cytoplasm showing coarse basophilic granules. The characteristic cytochemical reaction is metachromatic positivity with toluidine blue. All the blasts in our case revealed similar morphology. Other positive immunophenotypic markers are CD 11b, CD13, CD33, CD34, CD123, CD203c. Negativity for CD117, tryptase and CD25

differentiate ABL from mast cell leukemia. Electron microscopy reveals coarse granules with amorphous speckled substance and confirms the diagnosis. [2,10] In our case, immunophenotyping and cytogenetics study was not possible as bone marrow biopsy revealed only blood clot.

Differential Diagnosis: Differential diagnosis of ABL includes AML-M0 (EM shows absence of basophilic granules, AML M2 subtype with basophilia, acute eosinophilic leukemia, mast cell leukemia and CML in blast crisis. [10]

PROGNOSIS: Clinical progression in ABL and therapy related acute leukemia is very rapid and associated with poor prognosis. [3] The life threatening complication of this disease is due to persistent cytopenias due to failure of normal hematopoiesis because of accumulating blasts in the blood and bone marrow. Patients with therapy related acute leukemias have shortened survival than de novo AML. Supportive care is the standard management. [9] Our case also revealed a bad prognosis.

CONCLUSION

Acute basophilic leukemia in its pure form is extremely rare and has poor prognosis. Cytochemistry, immunophenotyping and electron microscopy help to make the diagnosis. Clinicians should be aware of therapy related leukemias to improve the initial treatment strategy while treating the malignancies.

REFERENCES

1. Ljubic N, Lang N, Skelin IK, Lasan R, Dominis M, et al. Klinefelter syndrome and acute basophilic leukemia- case report. Coll Antropol. 2010; 34(2): 657-660.
2. Larson R A, Lowenberg B, Connor R F. Therapy induced myeloid neoplasm: acute myeloid leukemia and myelodysplastic syndrome. [Internet].2015[updated 2015 March; cited 2015 Oct 15]. Available from www. uptodate. Com/contents/therapy-related-myeloid- neoplasms-acute-myeloid - leukemia-and-myeloblastic-syndrome? Source=outline_link&view=text&anchor=H1#H1.
3. Jaochim G. Uber mastzellenleukemien. Dtsch Arch Klin Med. 1906; 87:437.
4. Kritharis A and Brody J. Acute basophilic leukemia associated with loss of gene ETV6 and Protean complications. JCO 2011; 29 (21): 623-626.
5. Bennet JM, Catovsky D, Daniel MT, et al. Proposals for the classification of the acute luekemia. Br J Hematol 1976; 33:451-458.
6. Quattrin N. Follow up of sixty two cases of acute basophilic leukemia. Biomedicine 1978; 28:72-79.
7. Goh KO, Anderson FW. Cytogenetic studies in basophilic chronic myelocytic leukemia. Arch Pathol Lab Med 1979; 103:288-290.
8. Yamagata T, Miwa A, Eguchi M, et al. Transformation into acute basophilic leukemia in a patient with myelodysplastic syndrome. Br J Haematol 1995; 89:650-652.
9. Duchayne E, Demur C, Rubie H, Robert A, Dastugue N. Diagnosis of acute basophilic leukemia. Leuk Lymphoma 1999; 32(3-4):269-78.
10. Godley L A and Larson R A. Therapy related myeloid leukemia. Semin Oncol 2008; 35(4):418-429.

How to cite this article: Nanda P, Avinash M, Sharda S et al. Acute basophilic leukemia - A rare case report. Int J Health Sci Res. 2015; 5(11):439-441.

****