

Hairy Cell Leukemia

A Case Report

- *O AINOON MBBS (Mal), DCP(Lond),
*R MEGAT, MBBS, DTMP(UKM),
*S K CHEONG MBBS (Mal), DCP(Lond), MRCP(UK)
**Y HALIMAH MBBS (Mal), DCP(Lond)

*Department of Pathology,
Faculty of Medicine,
National University of Malaysia,
Jalan Raja Muda,
50300 Kuala Lumpur.

**Department of Pathology,
Hospital Besar Kelang,
41586 Kelang.

Summary: Hairy cell leukemia is a rare malignant lymphoproliferative disease. It has characteristic cytochemical, morphological and ultrastructural features. We report such a case in a pregnant Malay patient. The pregnancy was terminated.

Introduction

Hairy cell leukemia (HCL) is a malignant lymphoproliferative disease previously known as leukemic reticuloendotheliosis but now well recognised as a distinct clinicopathological entity. The disease is characterised by pancytopenia, splenomegaly and presence of abnormal mononuclear cells with irregular cytoplasmic projections in the blood, marrow and other tissues, especially the spleen. It is a rare disease (representing approximately two percent of adult leukemia) and has not been previously reported in this country. However a case was reported in 1986 in Singapore.¹ The median age of onset of HCL is 50 years. Eighty percent of the patients are male. We report here a case of HCL in a 22-year old pregnant Malay woman.

Case Report

K.Y., a 22 year old Malay housewife, was found to have a grossly enlarged spleen at a routine antenatal check-up at eighteen week's pregnancy. On admission, physical examination showed marked pallor, petechial haemorrhages, enlarged spleen which was palpable 15 cm below the left costal margin and liver which was palpable seven cm below the right costal margin.

Full blood count was as follows:
Total white cell count: $5.5 \times 10^9 / l$ (N17, L80, M₂, E1)
Hemoglobin: 8.6 g/dl
Red Cell count: $2.9 \times 10^{12} / l$
Packed cell volume: 0.240 (ratio)
Mean cell volume: 82 fl
Mean cell hemoglobin: 29.7 pg
Mean cell hemoglobin concentration: 35.8 g/dl
Reticulocyte count: 2.6%
Platelet count: $30 \times 10^9 / l$.

Peripheral blood film showed that 56% of the lymphoid cells had abnormal morphology – large cells with abundant cytoplasm and hairy cytoplasmic projections as shown in figure 1. The nucleus of the abnormal lymphoid cells appeared mature and eccentric.

Bone marrow aspirate:

Hypercellular bone marrow in which 77% of nucleated cells were lymphoid cells. The “hairy” nature of the lymphoid cells was not conspicuous except at the thin end of the bone marrow smears. Erythropoiesis and granulopoiesis were depressed. Megakaryocytes were normal in number and morphology.

Tartrate-resistant Acid Phosphatase Reaction:

Only 15% of the lymphoid cells showed positive reaction.

Surface Marker Studies:

Surface immunoglobulins were demonstrated on 85% of the lymphoid cells.

Ultrastructural Studies:

Typical hairy cells as illustrated in figure 2 were seen. No ribosome lamellar body was observed.

Progress Note:

Her pregnancy was terminated. She was then given supportive treatment as she refused splenectomy. She was discharged but defaulted on follow-up.

Discussion

Hairy cell leukemia was first described in 1958 by Bouroncle et al.² The clinical course and diagnostic criteria of this chronic lymphoproliferative disorder have been further defined in many subsequent series.^{3,4} The two main reasons why this uncommon disease has attracted the attention of clinical investigators are the unusual features of the hairy cells and the impressive clinical response observed with two drugs – interferon and deoxycoformycin.

The identification of the characteristic hairy cell, with abundant cytoplasm and irregular villous outline is one of the essential features in the diagnosis of HCL. A diagnosis, suspected on that basis often requires confirmation by one or other means. Bone marrow aspirate would show a lymphoproliferative process and the hairy morphology is usually inconspicuous as is the case with our patient. In most cases trephine biopsy demonstrates an increase in reticuline.

A unique cytochemical profile is given by positive tartrate-resistant acid phosphatase reaction and the characteristic crescentic arrangement of positive granules by alpha-naphthyl acetate esterase reaction not seen in any other B or T cell disorder. The acid phosphatase reaction is not a prerequisite for the diagnosis of HCL. Surface marker studies demonstrate B cell characteristic in most cases. In some, ultrastructural study by transmission electron microscopy is necessary to ascertain the nature of the proliferating cells, where the cells show a mature nucleus, infrequently a nucleolus and characteristic long cytoplasmic villi.

The treatment of HCL is primarily directed to relieving the consequences of pancytopenia. Indications for therapy include massive splenomegaly, bone lesions or a high white count [30,000 cells per microlitre]. Approximately 10 percent of patients have an indolent course requiring no specific therapy, and these patients are usually elderly men whose spleens are not palpable.

Splenectomy has been the mainstay of treatment as it corrects the pancytopenia in most patients and improves their survival when the spleen is enlarged more than five cm below the costal margin.⁵ However splenectomy has long lasting benefits only in a minority of patients because the bone marrow is also affected.³ This and the fact that in 10–20% of patients the spleen is not enlarged lead to about 80% of patients requiring other forms of treatment at some stage. Chlorambucil was formerly popular but has now been superseded by interferon. Chlorambucil has ameliorated the anemia and thrombocytopenia but persistent neutropenia has resulted in a 25% mortality rate from infectious complication.⁶

The use of alpha-interferon was first described by Quesada et al in 1984.⁷ Most studies done subsequently, showed a return of blood count to normal in 70 to 100 percent of patients with complete eradication of hairy cells in the peripheral blood and the bone marrow in a small minority. Therefore although interferon is highly effective it is rarely curative. Spiers et al have recently reported good result of treatment with the adenosine deaminase inhibitor 2-deoxycoformycin.⁸ Studies done have shown that in contrast with interferon, the duration of treatment required to obtain complete bone marrow remission is relatively short and prolonged remissions without maintenance treatment have been recorded in some patients.

Thus in the past five years two highly effective drugs have been developed for this rare disease. In deciding how to employ this new treatment as well as the former standard treatment, splenectomy, Golomb et al has come up with a recommendation:⁹ Patients with adequate blood counts and a non-palpable spleen need not be treated at all. Splenectomy is recommended for patients with cytopenias and a large spleen and they may not need any further therapy. In contrast, patients with a diffusely involved marrow and a spleen that is not palpable usually need further therapy within six to 12 months. Patients who fall between these two extremes present a more difficult problem, and their therapy must be individualized.

References

- ¹ Tan CC, Suri R: Hairy cell leukemia – A rare lymphoproliferative disorder. *Singapore Med. J.* 1987 28:2: 192–195.
- ² Bouroncle BA, Wiseman BK, Doan CA: Leukemic reticuloendotheliosis. *Blood* 1958; 13 : 609–30.
- ³ Catovsky D. Hairy cell leukemia and prolymphocytic leukemia. *Clinical Haematology* 1977; 6 : 245–68.
- ⁴ Golomb HM, Catovsky D, Golde DW: Hairy cell leukemia; a clinical review based on 71 cases. *Ann Intern Med.* 1978; 89: 677–83.
- ⁵ Jansen J, Hermas J, for the Collaborative study group. Splenectomy in hairy cell leukemia. A retrospective multicenter analysis. *Cancer* 1981; 47:2066–76.
- ⁶ Golomb HM, Schmidt K, Vardiman JW. Chlorambucil therapy of twenty-four postsplenectomy patients with progressive hairy cell leukemia. *Semin. Oncol* 1984; 11: Suppl 2:502–6.
- ⁷ Quesada JR, Reuben J, Manning JT, Hersh EM, Gutterman JU. Alpha interferon for the induction remission in hairy cell leukemia. *N Engl J Med* 1984; 310 : 15–8.
- ⁸ Spiers ASD, Parekh SJ, Bishop MB. Hairy cell leukemia: induction of complete remission with pentostatin (2-deoxycoformycin). *J Clin Oncol* 1984; 2 : 133–42.
- ⁹ Golomb HM, Ratain MJ. Recent advances in the treatment of hairy cell leukemia. *N Engl Med* 1987; 316 : 870–71.