CASE REPORT

Acute Myeloid Leukaemia with Plasmacytosis

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ABSTRACT

Association of acute myeloid leukaemia with bone marrow plasmacytosis is a rare phenomenon with diverse underlying pathogenetic mechanisms. We report a case of a 75 years old diabetic male diagnosed as suffering with plasmacytosis. There were no lytic bone lesions or Bence-Jones proteinuria. Serum protein electrophoresis did not show a monoclonal band. A presumptive diagnosis of AML with reactive plasmacytosis was made. Possible conditions which can be considered in differential diagnosis are discussed.

Key Words: *Acute Myeloid Leukaemia, Multiple Myeloma, Reactive Plasmacytosis.*

Introduction

Association of acute myeloid leukaemia (AML) with bone marrow (BM) plasmacytosis is a rare phenomenon with only a few cases reported in the literature.[1] The underlying pathogenetic mechanisms causing BM plasmacytosis in patients of AML appear to be diverse as shown in the table. In the literature it has been mainly reported to occur in patients of AML as reactive proliferation discovered at the time of diagnosis; after induction-chemotherapy and rarely with simultaneous occurrence of multiple myeloma (MM).[2-4] We report a case of AML with reactive plasmacytosis in an elderly diabetic and discuss the differential diagnosis.

Case Report

A 75-year-old male patient presented with complaints of low grade fever and lassitude of two month duration in the Medical OPD of Military Hospital Rawalpindi. He was a known case of type 2 diabetes mellitus for the past 25 years. On examination, he was pale and emaciated. Blood counts revealed pancytopenia with hemoglobin of 6.7 g/dl, white blood cell count of $1.8x10^9$/l and platelet count of $87x10^9$/l. Peripheral film showed rouleaux formation and ESR was 130 mm at the end of first hour. Serum urea and creatinine levels were raised (15.8 mmol/l and 225 µmol/l respectively). Serum calcium levels were normal. His BM aspirate showed 75%blast cells and an increase in the plasma cells to 15% (Fig 1). BM trephine showed prominent plasma cells present interstitially as well as in small clumps (Fig 2). Diagnosis of AML with plasmacytosis was considered and further investigations were done to rule out concomitant MM.

Skeletal survey did not show any lytic lesions. Urine examination for Bence-Jones proteins was negative. Serum protein electrophoresis revealed hypoalbuminaemia and a polyclonal increase in gamma globulins. No paraprotein band was detected. Serum free light chain assay was not done due to non availability. Analytical immunocytometry revealed 'AML with differentiation' (FAB type: AML-M2). Cytogenetics showed a normal karyotype. A presumptive diagnosis of AML-M2 with reactive plasmacytosis was made and patient was shifted to the oncology ward but he died the next day before chemotherapy could be initiated. (Total duration of stay at the hospital was 12 days).

Discussion

Reactive BM plasmacytosis is characterized by an increase in the percentage of plasma cells above the normal, i.e. more than 3% but generally it does not exceed 20%.[5] It is seen in chronic infections, autoimmune diseases, connective tissue disorders, diabetes mellitus and malignancies. Rare causes include angioimmunoblastic lymphadenopathy and multicentric Castleman's disease. In AML , reactive BM plasmacytosis may be due to the presence of either some concomitant, or preceding inflammatory or infectious disorder and the plasma cells are considered to proliferate due to persistent antigenic stimulation.[3] Paracrine stimulation by interleukin (IL)-6 secreted by leukaemias cells has also been proposed as a cause.[2,6,7] Our patient was a known diabetic and patients with diabetes mellitus

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are prone to acute and chronic infections, which might have been responsible for reactive plasmacytosis. AML with reactive plasmacytosis has to be differentiated from a very rare, simultaneously occurring AML with concomitant MM.[4,7] This is important because the latter requires different therapeutic approach.

Clues from history, clinical examination, and

Table: Causes of AML with plasmacytosis

1.	**AML with reactive plasmacytosis**
a.	Due to persistent antigenic stimulation because of infection
b.	Due to paracrine stimulation of plasma cells by IL-6 from blast cells
c.	Post induction chemo therapy
2.	**AML with concomitant MM**
a.	AML secondary to chemotherapy in patient of MM
b.	AML with MM without any history of chemotherapy

AML= Acute myeloid leukaemia, IL= Interleukin, MM=Multiple myeloma

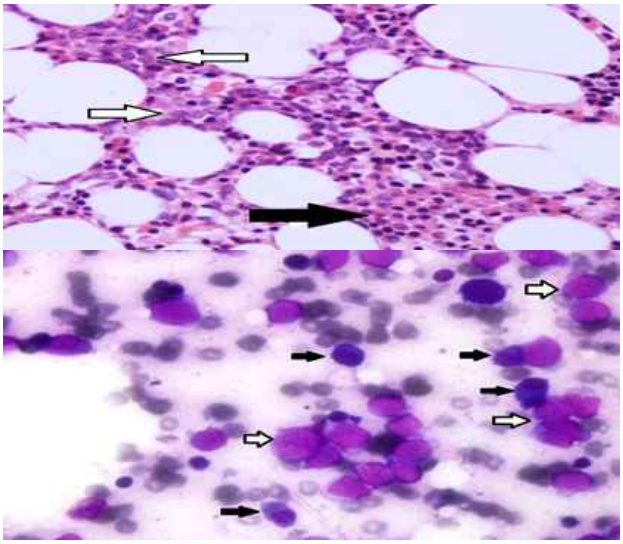

Fig 1: Bone marrow aspirate and trephine showing blast cells and plasma cells indicated by white arrows and black arrows respectively (Magnification: 40x).

presence of a monoclonal band on serum protein electrophoresis, serum free light chain assay, and whole body magnetic resonance imaging (MRI) for bone lesions, help in the diagnosis of a concomitant MM. Our patient did not have any bony lytic lesions, Bence Jones proteinuria, or a monoclonal para-protein band. Serum free light chain assay was required to rule out myeloma with more certainty but not done due to non availability. Hence our diagnosis of AML with reactive plasmacytosis was presumptive. Cytological features may help to differentiate reactive plasmacytosis from MM but no discriminatory cut-off value of plasma cells percentage in the BM has been defined. Normally, plasma cells are scattered interstitially and may be seen associated with macrophages and around the capillaries.[5] In reactive plasmacytosis, the plasma cells have mature nuclear and cytoplasmic characteristics, although binucleate forms may also be seen. A few small clumps may also be seen in case of reactive plasmacytosis but the number of plasma cells in the clumps is generally less than ten.[5] The presence of plasma cell dysplasia and plasmablasts is strongly suggestive of multiple myeloma. Cytological features in our patient favoured reactive plasmacytosis.

Patients with multiple myeloma (MM) or monoclonal gammopathy of undetermined significance have an increased inherent risk of developing acute myeloid leukemia (AML) which is independent of prior chemotherapy.[4] A common aetiologic agent could be responsible for some cases of concomitant AML and MM. AML is a morphologically, genetically, phenotypically and biologically heterogeneous disorder and plasmacytosis is seen in 6-7 % of cases of AML.[2] Does AML with reactive plasmacytosis also qualify as a separate entity in the classification of AML? Microscopic examination of the stained smear of BM from a patient of AML with reactive plasmascytosis has distinctively identifiable features comprising of blasts cells and conspicuously increased plasma cells. However no unique clinical, phenotypic, cytogenetic, molecular and biologic properties have been identified to merit its classification as a homogenous separate entity.

Conclusion

AML with plasmacytosis is a heterogenous phenomenon. Reactive plasmacytosis in AML must be differentiated from AML with MM as the latter requires different therapeutic approach.

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