

Plasma Cell Leukemia: Case Report of a Rare and Aggressive Variant of Multiple Myeloma

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Abstract

Plasma cell leukemia (PCL) is a rare disease and is the least common variant of multiple myeloma accounting for 2-3% of all plasma cell dyscrasias. We report a patient who presented with history of high grade fever, weakness, palpitations, loss of appetite, bone pains and mental confusion for twenty days. Initial evaluation revealed plasmacytosis with blood plasma cell count of 5184/cumm. His hemoglobin (Hb) was 11.3 gm/dl, platelets were 75000/cumm and total leucocyte count (TLC) was 21600/cumm (24% plasma cells). Bone marrow examination revealed >60% plasmablasts. Serum LDH was high at 3117 U/L and serum calcium was also elevated at 13.9 mg/dl. A diagnosis of PCL was made and the patient was started on treatment for hypercalcaemia with Melphalan/Prednisolone regime along with supportive care. Patient deteriorated very rapidly despite treatment and died on the eighth day. A detailed report of this case and a review of PCL is presented here.

Introduction

Plasma cell leukemia (PCL) is a rare variant of multiple myeloma accounting for 2-3% of myeloma and other plasma cell dyscrasias. PCL can occur either de novo (primary) or in patients with long standing multiple myeloma (secondary). PCL is derived from terminally differentiated B-cells and the malignant cells stain positive for mature B-cell markers (CD38 and PCA-1).^{1,2} Diagnosis is made when there are >2000/cumm circulating plasma cells in the peripheral blood and plasmacytosis >20% of total leucocyte count (TLC).² PCL patients usually have accompanying anemia, hypercalcemia, renal insufficiency and organomegaly.^{2,3} Two types of PCL are seen: secretory and non-secretory. No M-protein is detected in the non-secretory type of PCL.³

PCL is an extremely aggressive disease with no standard treatment regime so far due to the rarity of the disease. Melphalan/Prednisolone (MP), infusional vincristine, doxorubicin and dexamethasone (VAD) or thalidomide/dexamethasone (TD) regimes have been tried but the outcome has been dismal.²⁻⁴ Prognosis is generally very poor with a median survival of 2-8 months.^{2,4}

We present a case of PCL diagnosed in Department of Medical Oncology at Khyber Teaching Hospital, Peshawar in February 2005.

Case Report

A 51 year old male patient presented to Oncology clinic with a history of high grade fever (102°F), loss of appetite, weakness, palpitations, generalized bone pains and mental confusion for twenty days. On examination, his blood pressure was 160/90mmHg, temperature 102°F and pulse 114/minute. Patient was conscious but confused. Initial laboratory investigations revealed the following: Haemoglobin 11.3 gm/dl; platelets 75000/cumm and Total Leukocyte Count (TLC) 21600/cumm (neutrophils 44%, lymphocytes 22%, monocytes 04%, myelocytes 06% and plasma cells 24%). Absolute plasma cell count on peripheral smear was extremely high at 5184/cumm. Bone marrow aspiration also revealed >60% plasmablasts with decreased megakaryocytes. Total serum calcium was elevated at 13.9 mg/dl (normal = 8.5-10.5 mg/dl). Ionized calcium was also elevated at 7.21 mg/dl (normal = 4.4-5.4 mg/dl). Serum LDH was very high at 3117 U/L (normal = up to 460 mg/dl). SGOT (ALT) was elevated at 230 U/L (normal = up to 38 U/L) while rest of the liver function tests were within normal range. Random blood sugar was also normal at 129 mg/dl (normal = up to 160 mg/dl). Total serum proteins were within normal range at 8.2 gm/dl (normal 6-8.5 gm/dl) but serum albumin was low at 2.4 gm/dl (normal = 3.8-5 gm/dl), serum

globulin was raised at 5.8 gm/dl (normal = 1.8-3.6 gm/dl) and A/G ratio was reversed at 0.41 (normal = 1.1-2.2). Plasma electrophoresis also revealed low albumin levels at 35.1 (normal = 53-68). Alpha 1 was 2.3 (normal = 2-5); alpha 2 was 5.5 (normal = 7-10); beta was 5.3 (normal = 8-13) and gamma globulin was raised at 51.8 (normal = 13-21). There was a discrete band at gamma globulin level on electrophoresis with an increase in gamma globulin levels. Abdominal ultrasound showed mild splenomegaly. X-rays of chest, skull, spine and pelvis were normal.

Patient was therefore diagnosed as having secretory PCL. He was immediately started on intravenous hydration with sodium chloride, steroids, zyloric, furosomide and other supportive care. After 24 hours, rigorous intravenous hydration was continued along with blood products, intravenous steroids and Tab. Allopurinol while Tab. Melphalan 15 mg/day and Inj. Aredia (Pamidronate disodium) 60 mg by slow intravenous infusion (stat) were also started. Condition of the patient worsened and on day three, his Hb fell to 7.8 gm/dl, platelets came down to 6000/cumm, circulating plasma cells were 5200/cumm, total calcium remained elevated at 13 mg/dl despite treatment and patient developed renal failure with a serum creatinine of 18.5 mg/dl (normal = 0.6-1.2 mg/dl). Blood/platelet transfusions were continued along with the above mentioned treatment and patient was also dialyzed in emergency but despite these efforts, the patient expired on eighth day after diagnosis.

Discussion

Rarity of PCL can be assessed from the fact that at M.D. Anderson Cancer Center, 27 patients with PCL were seen in 20 years period whereas at Policlinico San Matteo in Italy, 15 cases were seen in 15 years both representing 2-5% of total cases of multiple myeloma seen at these centers.^{5,6} Overall, incidence of PCL is less than 1 case per million population.⁷ This is also the reason for lack of prospective data on treatment regimes and treatment outcome in large trials in this disease.

In our unit, this was the first case of PCL since 1999.

Our patient presented with the typical clinical features of weakness, fever, bone pains and mental confusion. In addition to these, he also had bad prognostic factors of hypercalcemia and high serum LDH. These are the known bad prognostic signs in the already aggressive disease.^{5,8}

Response of PCL to treatment is not good. Median survival of 2-8 months is reported with M+P (Melphalan and Prednisolone) regime or VBAP (Vincristine, Carmustine, Adriamycin and Prednisolone) regime.⁹ VAD (infusional vincristine, adriamycin and dexamethasone) regime used in multiple myeloma has shown some good responses in early stage PCL, although most of these studies are based on case reports.^{1,10} Case reports regarding long term survival after autologous bone marrow transplant or stem cell transplant also exist but again there is no long term, prospective data on a larger number of patients.

In summary, PCL is an aggressive and rare variant of multiple myeloma with poor outcome. No large trials are available on treatment of this disease but VAD regime and bone marrow/stem cell transplant has shown some long term survivals in individual cases.

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