Case Report

Plasma Cell Leukemia with Hyperleukocytosis
A Rare Presentation

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Abstract
Plasma cell Leukemia is a rare aggressive malignancy of plasma cells. The disease has acute onset, rapid course, poor prognosis and poor response to therapy. PCL may be primary (arising de novo) or secondary transformation of multiple myeloma. We present a case of 50 years old man who presented with bone pains and weakness and was referred to us with suspicion of leukemia. To our surprise he had very high leucocyte count with more than 70,000 plasma cells in peripheral blood. His ESR was 140mmHg and Serum protein electrophoresis showed strong M band. Based on all these findings he was labelled as a case of plasma cell leukemia. He was started with the treatment but unfortunately it did not work and he died within a month.

Key words: Plasma cell leukemia; primary plasma cell leukemia; secondary plasma cell leukemia

Introduction
Plasma cell leukemia (PCL) is a rare and aggressive variant of plasma cell dyscrasias, characterized by presence of circulating plasma cells, acute course, extramedullary involvement and poor prognosis.¹ The diagnosis of PCL is based on presence of ≥ 20% plasma cells or absolute number ≥ 2,000 in peripheral blood.² The incidence of plasma cell leukemia varies between 2-4% patients with multiple myeloma. Median age at diagnosis is 55 years.³ Male to female ratio is 3:2.⁴ Plasma cell leukemia may be a primary disease (primary plasma cell leukemia – pPCL) which presents as de novo leukemia or secondary leukemic transformation (secondary plasma cell leukemia – sPCL) of pre-existing multiple myeloma.⁵ The median time to leukemic transformation for patients with MM who evolve to sPCL is 21 months.⁶ Patients of plasma cell leukemia may present with symptoms due to profound anemia, hypercalcemia or bleeding diathesis owing to thrombocytopenia. On physical examination, patients may exhibit a higher prevalence of organomegaly with involvement of the liver, spleen, lymph nodes, pulmonary findings associated with pleural effusions, neurological deficits due to central nervous system involvement, pallor, petechiae or palpable extramedullary soft-tissue plasmacytomas. Primary plasma cell leukemia presents with high tumor burden and poor prognosis. Lytic bone lesions are more common in secondary plasma cell leukemia and rare in primary one. Peripheral blood film shows marked rouleaux formation. Bone marrow shows diffuse infiltration by plasmablasts. Normal hemopoietic tissues are markedly reduced. These patients thus present with more profound anemia and thrombocytopenia. The morphological features of plasma cells (PCs) can differ depending upon their maturity. Mature PCs are oval with abundant basophilic cytoplasm. The nucleus is round and eccentrically located and the chromatin arranged in pyramidal blocks against the nuclear membrane, giving the characteristic “cartwheel” appearance. Immature PCs have dispersed nuclear chromatin, prominent nucleoli and high nuclear to cytoplasmic ratio. The findings on bone marrow aspiration and biopsy are similar to those seen in multiple myeloma without PCL and demonstrate an increased number of monoclonal PCs. The pattern of infiltration is mostly diffuse in all cases and this infiltration is able to disrupt normal hematopoiesis. Immunophenotypic characteristics shows CD38 and CD138 antigen expression and are excellent PC marker, but these do not differentiate between multiple myeloma and plasma cell leukemia. However negative expression of CD56 characteristically expressed on myeloma cells is absent from patients with PCL and has been associated with extramedullary multiple myeloma. Acquisition of the CD28 antigen on PCs appears to correlate with an increased proliferative rate and disease progression.⁶ In general, patients are treated with aggressive induction therapy followed by HCT (haematopoietic stem cell transplantation) in those who are appropriate candidates for this approach. Chemotherapy alone is the principal option for those ineligible for HCT. We present a case of 50 years old man who came to us with suspicion of acute leukemia and was diagnosed as a case of plasma cell leukemia on basis of peripheral blood and bone marrow examination.
Case Report

A 50 years old man was referred to our centre for peripheral blood examination with suspicion of acute leukemia. He gave history of epistaxis (off and on) for the past three years, bone pains in arms and legs for the past 6 months, cough for 1 month and pain in right hypochondrium for the last 1 month. Apparently the patient was very toxic and pale looking. Other physical examination was unremarkable except that his liver was palpable 3 cm below costal margin. His Blood CP showed TLC of 84,800/μl, Hemoglobin 7.74 gms/dl and platelet count of 65,700/μl. Peripheral blood examination revealed marked rouleaux formation with 91% plasma cells (absolute count=77,168) (Figure 1 & 2). ESR was 140mm/hr and the patient was thus advised for bone marrow biopsy, serum protein electrophoresis, urine protein electrophoresis and skeletal x-rays for lytic lesions. Bone marrow biopsy was done; it showed markedly increased plasma cells (92% of nucleated cells) with distinct suppression of erythroid, myeloid and megakaryocytic series cells) (Figure 3). Histological examination of trephine biopsy also showed diffuse infiltration by plasma cells. Serum protein electrophoresis showed a strong M band(Figure 4), however x-rays skull and chest were unremarkable (no lytic lesions). On the basis of all these findings the final diagnosis of plasma cell leukemia was made. He was started with treatment and initially improved clinically but unfortunately his condition deteriorated and he died within a month after the diagnosis.

Discussion

Plasma cell leukemia (PCL) is a rare disorder. Patients may either present de novo (PPCL), or PCL may occur during the course of multiple myeloma (secondary PCL). PPCL may account for about 60% and secondary PCL for about 40% of cases. Patients with PPCL are described to have more extramedullary disease, anemia, thrombocytopenia, hypercalcemia, renal failure, increased LDH, and β2-microglobulin, as compared to secondary disease. The median survival and response to therapy is also poor in PPCL as compared to SPCL. Amongst the unfavourable prognostic variables, serum β-2 microglobulin level > 6mg/l is significant.
Rarity of PCL can be accessed 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. Overall, incidence of PCL is less than 1 case per million population. This is also the reason for lack of prospective data on treatment regimes and treatment outcome in large trials in this disease. Very few cases have been reported from Pakistan. Jameel reported a case of 51 years old man who presented with weakness and bone pains and had TLC of 21600 with 24% plasma cells in peripheral blood and patient died on the 8th day after diagnosis despite treatment. Our case presented almost similarly with weakness and bone pains but had very high TLC with groups of plasma cells in peripheral blood and physician suspicion was of acute leukemia rather than unexpected plasma cell leukemia. Unfortunately the patient could not respond to chemotherapy and died within a month after diagnosis. Badhe et al presented two cases of plasma cell leukemia, both had abrupt onset of disease and presented with fatigability and weakness, organomegaly and radiological and hematological evidence of plasma cell leukemia. Both had poor response to therapy and short survival time.

Fathima J.L et al. presented a case of PCL in a 40 years old female who responded well to treatment. Singh et al. reported a case of 70 year old male who presented with weakness and showed plasma cells and plasmablasts in peripheral blood and bone marrow. Review of local literature also revealed few cases of plasma cell leukaemia. Sajid and Moiz et al reported a case of 55 years old female of SPLCL who presented with productive cough, shortness of breath and pleural fluid plasmacytosis. Our case presented with very high leukocyte count of 84,800/μl with distinctly high plasma cell count of 77,168. Very few cases of plasma cell leukemia presenting with hyperleukocytosis have been reported. Desai reported a case of plasma cell leukemia in a 55 years old male with total leukocyte count of 45,000/μl and 78% plasma cells. Moiz et al reported an unusual case of plasma cell leukemia in a 35 years old multigravida at 34th week of pregnancy with unusually high leukocyte count of 259 X 10^9 and 90% plasma cells.

Response of PCL to treatment is not good. Median survival of 2-8 months and with primary plasma cell leukemia and with high tumor burden it is very short. Even intensification of treatment regimens has not given promising results. However bone marrow transplant has shown some improvement in younger patients.

References