Chronic neutrophilic leukemia: A very rare case report

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ABSTRACT

Chronic neutrophilic leukemia (CNL) is a rare BCR/ABL negative myeloproliferative disease characterized by persistent mature neutrophilia, raised serum vitamin B12, raised neutrophil alkaline phosphatase (NAP), hepatosplenomegaly, and raised serum uric acid. We report a very rare case of CNL who initially responded to treatment and finally developed respiratory tract infection and septicemia and succumbed to death.

Keywords: Leukemia, Myeloproliferative disease, Neutrophilia

Please cite this article as: Vujhini SK, Sanagapati PR, Kandukuri MK3, Bonagiri S. Chronic Neutrophilic Leukemia: A Very Rare Case Report. Perspectives in medical research 2015;3:31-33.

Source of Support: Nil, Conflict of interest: None Declared

INTRODUCTION

Chronic neutrophilic leukemia (CNL) is a rare BCR/ABL negative myeloproliferative disease characterized by persistent mature neutrophilia, raised serum vitamin B12, raised neutrophil alkaline phosphatase (NAP), hepatosplenomegaly, and raised serum uric acid. [1] It is usually seen in the elderly population and generally affects both sexes equally. Prognosis is generally poor, with a median survival rate of less than three years. We report a case of an elderly female who initially presented with abdominal distension and hematemesis.

CASE REPORT

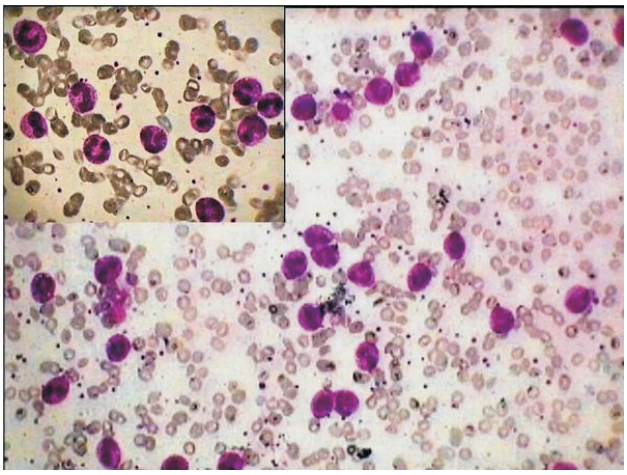
A 65 years old female presented with progressive abdominal distension and sustained neutrophilia for six months and later with hematemesis. There was no history of fever or lymphadenopathy. On clinical and radiological examination, she had hepatomegaly, splenomegaly and ascitis. Endoscopic examination revealed esophageal varices suggesting portal hypertension, which was the cause for hematemesis. Her routine laboratory investigations are shown in the Table1.

Table 1: Routine laboratory investigations of the patient

Investigation	Value
Hemoglobin	10.8 g/dL
Total WBC count	47,000/ /cu mm
RBC Count	3.76 millions/cu mm
Differential count Neutrophils	95 %
lymphocytes	02 %
Monocytes	02 %
Eosinophils	01 %
Platelet count	4.5 lakhs/ cu mm
Absolute neutrophil count	44, 400 cells/ cu mm
ESR	16 mm Hg (First hour)
Urea	30 mg/ dl.
Creatinine	0.9 mg/ dl.
Serum Vit. B12	2000 pg/ml
Serum uric acid	10.9 mg/dl

Peripheral smear examination showed marked neutrophilia with toxic granules and normal platelet count (Figure 1).

Figure1: Peripheral smear showing plenty of neutrophils (Leishman stain x400), Inset x1000



Ascitic fluid was transudate with no cells. Her serum vitamin B12 levels and uric acid levels were highly raised. Her renal function tests were normal. Bone marrow examination showed hypercellularity with myeloid hyperplasia comprising of mature neutrophils and band forms upto 90%. There was neither dysplasia of the myeloid series, nor increased blasts. Neutrophil alkaline phosphatase (NAP) score was high. Philadelphia chromosome and BCR/ABL transcript gene were negative. Based on these findings, a diagnosis of chronic neutrophilic leukemia was made after ruling out other causes of neutrophilia. She was treated with hydroxyurea and achieved a hematological response by three months with normalization of WBC count and regression of organomegaly.

After five months, she developed respiratory tract infection, septicemia and finally succumbed to death.

DISCUSSION

Chronic neutrophilic leukemia is a rare entity characterized by persistent mature neutrophilia, hepatosplenomegaly, elevated serum vitamin B 12 levels, hyperuricaemia, raised alkaline phosphatase, absence of dysplasia and reticulin fibrosis in the bone marrow. These findings together with absence of basophilia, monocytosis and BCR/ABL transcript define the disease. [1] CNL has been considered as a rare distinct entity in WHO classification of hematopoietic malignancies. The first case of CNL was reported in 1920 by Touhy and Tanzer et al introduced the term chronic neutrophilic leukemia in 1964.

CNL is a disease of the elderly with a mean age of 62 years, although rare cases occurring in adolescents have been described in the literature. Most patients present with peripheral leucocytosis with a mean WBC count of 50x 10^9 cells/ L with predominantly mature neutrophils and band forms. Most of the patients present with normal hemoglobin and platelet count. Serum uric acid and vitamin B12 levels are usually increased and have high neutrophilic alkaline phosphatase. The neutrophilic function with nitroblue tetrazolium test reveals impaired phagocytic activity. Bone marrow examination shows marked neutrophilic proliferation without any dysplasia of myeloid series. Philadelphia chromosome and BCR/ABL transcript gene are negative. Death is usually due to cerebral hemorrhage, fulminant infection or blastic transformation. [2-4]

CNL has to be differentiated from the usual causes of neutrophilia such as underlying malignancy, infection, inflammation, or leukemoid reaction. [5] Secondary neutrophilia can be seen in association with multiple myeloma. Chronic myeloid leukemia (CML) can present with neutrophilia and Philadelphia chromosome has to be tested for. Neutrophilia can occur as a component of myelodysplastic syndromes and the dysplastic changes in the precursor cells of marrow has to be looked for.

Treatment modalities include oral chemotherapy with hydroxyurea and busulphan to control hyperleucocytosis. Alpha interferon therapy as in CML has also been tried. Allogenic bone marrow transplantation has been tried for younger individuals for attainment of remission.

CONCLUSION

CNL is a rare entity and is a diagnosis of exclusion with a poor prognosis and it should be considered in the differential diagnosis whenever the absolute neutrophil count is very high.

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