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Original Research Paper

Pathology

A RETROSPECTIVE STUDY OF BONE MARROW ASPIRATION IN CHRONIC MYELOID LEUKAEMIA (CML) PATIENTS AT TERTIARY CARE HOSPITAL OF JHARKHAND

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ABSTRACT **Introduction:** Chronic myeloid (myelogenous, granulocytic) leukaemia (CML) is a myeloproliferative disorder characterized by proliferation of granulocyte lineage cells and characteristic reciprocal translocation involving chromosomes 9 and 22 leading to BCR-ABL1 fusion gene. It comprises about 20% of all leukaemias. In order to assess the burden of these diseases for public health planning, it is important to study their pattern of epidemiological variables. **Aim:** A study to determine the clinical and haematological profile in CML patient in Jharkhand, India. Methods: All suspected cases of CML in Peripheral Blood Smear were subjected to bone marrow aspiration, stained with Leishman stain and examined under light microscope. Results: In total of 42 patients, mean age was 36 years, male-female ratio of 2:1 with most of the patients in chronic phase of CML and none in CML-blast crisis. The commonest symptoms of the patients were pain and distension of abdomen (73.80%). **Conclusion:** Most CML patients in Jharkhand are relatively young (21–40 years). In addition, males were more commonly affected.

KEYWORDS : myeloproliferative disorder, chronic myeloid leukaemia, bone marrow aspiration, chronic phase, splenomegaly.

INTRODUCTION

Myeloproliferative disorders are characterized by proliferation of one or more myeloid lineages cells. These includes chronic myelogenous leukaemia, primary myelofirosis, polycythemia vera, and essential thrombocythemia[1,2].

Chronic myeloid leukaemia makes 20% of leukaemia3. There is a slight male preponderance (male:female ratio 1.6:1). The median age at diagnosis is 55–65 years. It is uncommon in children. CML is a clonal hematopoietic stem cell disorder.

The disease is driven by the BCR-ABL1 chimeric gene product, that codes for a constitutively active tyrosine kinase. resulting from a reciprocal balanced translocation between the long arms of chromosomes 9 and 22, t(9;22) (q34.1;q11.2), known as the Philadelphia chromosome (Ph)4 in more than 90% of cases[5,6]. In the remaining cases the BCR-ABL1 fusion gene is formed by cytogenetically complex or cryptic rearrangements5.

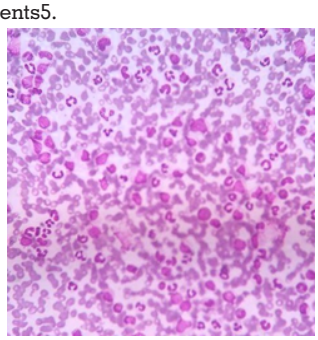

Fig.1: Bone Marrow Picture Of CML

The Ph chromosome is also be found in 25% and 5% of adult and childhood ALL, respectively7 where it is associated with relatively poorer prognosis. Patients suspected of having CML or another myeloproliferative neoplasm should be tested for BCR-ABL1 for definitive diagnosis[8].

Untreated, the course of CML is typically biphasic or triphasic, with an early indolent or chronic phase, followed often by an accelerated phase and a terminal blastic phase[4].

CML-chronic phase is characterized by left-shifted granulocytosis with maintained terminal differentiation, Leukocytosis ranging from 10–500 × 10 9 /L4 frequently accompanied by basophilia and sometimes eosinophilia. Thrombocytosis and mild anemia are also common. Bone marrow aspirate and histology are hypercellular for age with increased myeloid series cells in all stages of maturation, but demonstrate complete cellular maturation. A fairly typical finding is micromegakaryocytes, which are small, monolobated megakaryocytes[8,9,10].

In developed countries, 50-60% cases of CML are detected on routine blood examination with minimal symptoms like fatigue7. While majority of cases in under-developed countries present with massive splenomegaly[8,9], fatigue, weight loss, fever, night sweats, bone pain, abdominal pain, and fullness[11].

AIM OF THE STUDY

To study the clinico-epidemiological characteristics of patients of CML in Jharkhand.

MATERIALS AND METHODS

This was a retrospective study, performed in the Department of Pathology, RIMS, Ranchi. Study Population included 42 cases of CML diagnosed in peripheral blood smear (PBS) and subjected to bone marrow aspiration from January 2017 to December 2019.

Study Procedure involves case reports having patient age, sex, site of bone-marrow aspiration, clinical history with liver, spleen and lymph node status. All the air-dried bone marrow smear slide was stained with Leishman stain and examined under the light microscope.

RESULT

In our study, bone marrow aspiration in most of the cases were easily done from anterior superior iliac spine (ASIS) followed by posterior superior iliac spine (PSIS) and in few cases (esp. older age) were aspirated from Sternum. Marrow was hypercellular in all cases.

In the present study a total 42 cases were included having age group of 5-73 years, out of which 28 (66.7%) were male and 14 (33.3%) were female amounting to a male-female ratio of 2:1.

Bansal et al observed similar findings of male preponderance of CML ranging from 0.8:1 to 1:3 in various hospitals in India[12].

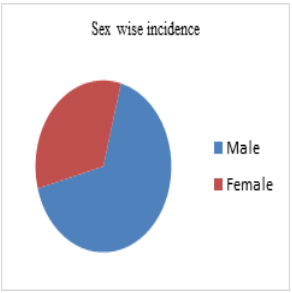

Fig.1: Sex-wise Incidence

Mean age of patient in our study was 36 years. Most of the patient (60.2%) belonged to the age group of 21 to 40 years. Among males, age group of 21-30 years were found to be more susceptible whereas in Females, 31-40 years age group were more susceptible. Bansal et al in their study found that median age in India of CML patients varied from 32-42 years12 which is a more than a decade younger to that of European(55 years) and American patients(66 years)[13,14]. Our study concurs to this finding.

Table – 1 Age-wise Incidence

Age group(years)	Number of Males	Number of Females	Total
01-10	1	0	1
11-20	2	1	3
21-30	9	4	13
31-40	7	6	13
41-50	4	1	5
50-60	3	1	4
>60	2	1	3
Total	28	14	42

It was found that 31 (73.80%) patient presented with a clinical feature of abdominal pain/ fullness/ distension followed by 22 (52.38%) with splenomegaly, 14 (33.33%) with generalised weakness, 10 (23.80%) with fever, 4 (9.52%) with weight loss and 3 (7.14%) with loss of appetite. While Bansal et al mention splenomegaly as the commonest finding in CML patients followed by hepatomegaly, fatigue, weakness and dragging pain.

Most of the patient were diagnosed in Chronic phase of CML (Blast <10%), which amounts to 97.6% of all patients. whereas 1 case was diagnosed in Accelerated phase of CML (Blast = 15%) and none in the blast crisis, which implies early detection of cases. Bansal et al also showed that 85-97% of patients presented in chronic phase of CML in different parts of India12 ,while in European data, the presentation of CML in chronic phase has been reported to be as high as 96.8%13.

Table – 2 Clinical Features Of CML Patients

Clinical Feature	No. of Patient
Abdominal pain/fullness/ /distension	31
Splenomegaly	22
Generalised weakness	14
Fever	10
Weight loss	4
Loss of appetite	3

CONCLUSION

CML in Jharkhand was found to be more common in young adult males (21-40 age) with abdominal distension/ pain/ fullness as the most common presenting symptom. Most cases were diagnosed in CML-chronic phase.

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