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Presentations Of Chronic Myeloid Leukemia Among Patients At A Central Laboratory, Asmara, Eritrea. A Descriptive Retrospective Cross-Sectional Study

Amin A. Alamin
Department of Pathology, College of Medicine, Taif University, Taif, Saudi Arabia

ABSTRACT:
Background/Aims: *Chronic myeloid leukemia (CML) is a type of cancer that affects the blood and bone marrow. The purpose of this study was to evaluate the age and sex characteristics, and clinical presentation of CML in Eritrea.*
Material and Methods: *A descriptive retrospective cross-sectional study was conducted at a central Laboratory in Asmara, Eritrea, from December 2015 to July 2017. The medical and laboratory data of the patients were collected using a structured questionnaire based on age, gender, presenting complaints, and clinical findings.*
Results: *17 cases were reviewed, and chronic myeloid leukemia constituted (8.3%). The male patients were more than females (52.9% vs. 47.1%). Chronic myeloid leukemia mainly affected those aged 41-60 years (41.2%), while the least affected were those aged 61-80 years (11.8 %). The most common symptoms reported were abdominal pain/distention (29.4 %), followed by fever (25.2 %), and weakness/fatigue. Splenomegaly (100%), and hepatomegaly (17.4%) were the most physical examination findings.*
Conclusion: *The relatively young population suffers the most, and abdominal pain/distention, and fever, are the primary presenting complaints. Splenomegaly and hepatomegaly are the main physical examination findings among patients with Chronic myeloid leukemia.*
Key words: *Chronic myeloid leukemia, abdominal pain/distention, fever, splenomegaly, hepatomegaly, National Health Laboratory.*

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I. Introduction

Chronic myeloid leukemia (CML) is a form of blood cancer that starts in the bone marrow, the spongy tissue inside bones responsible for producing blood cells. It is characterized by an overproduction of white blood cells, known as granulocytes. Chronic myeloid leukemia is considered a chronic form of leukemia, as it progresses slowly and is identified by the presence of a specific genetic mutation, known as the Philadelphia chromosome [1].

The incidence of hematological malignancies, including (CML), in Eritrea is not well-established. However, when compared to the worldwide incidence of leukemias, CML is a relatively rare disease, accounting for approximately 10-15% of all leukemia cases [2].

A study in Eritrea found that CML was the second most frequent hematologic cancer, accounting for 28.8% [3]. This aligned with studies from Bangladesh and Iran [4,5]. The incidence was higher than in Saudi Arabia [6] but lower than in Ethiopia[7].

CML is classified into three stages: chronic, accelerated, and blast crisis. In the chronic stage, patients often have minimal or no symptoms, and the progression of the disease is slow. In the accelerated stage, there is a sudden increase in the number of white blood cells, and symptoms may become more severe. In the final stage, blast crisis, the disease has progressed to acute leukemia, and symptoms are severe and can be life-threatening [8].

The pathophysiology of CML is closely linked to the genetic mutation known as the Philadelphia chromosome. This mutation results in the overproduction of white blood cells and the inhibition of normal cell growth and death [9].

This genetic change is caused by a translocation between chromosomes 9 and 22, known as the t (9;22) translocation [10]. The presence of this genetic change is considered a hallmark of CML and is present in nearly all cases [11].

The age and sex distribution of CML vary among populations, with peak incidence among individuals 40-60 years old and a slight male predominance [12]. In Eritrea, limited data exist on the age and sex characteristics of CML. A study conducted in Sudan found that the most affected age group was 40-50 years old, with a slight male predominance [13].

The clinical presentation of CML can vary depending on the stage of the disease. In the chronic stage, symptoms may be mild and may include fatigue, weight loss, and an enlarged spleen. In the accelerated and blast crisis stages, symptoms may be more severe and may include fever, night sweats, and bleeding [14]. In a study conducted in India, it was found that common presenting symptoms of CML were fatigue, weakness, anemia, and weight loss [15].

The diagnosis of CML is typically made through a combination of blood tests, bone marrow biopsy, and genetic testing. A complete blood count and peripheral blood smear can reveal the presence of increased granulocytes [16]. A bone marrow biopsy can confirm the diagnosis and determine the stage of the disease [17]. Genetic testing, such as fluorescence in situ hybridization (FISH) or polymerase chain reaction (PCR), can detect the presence of the Philadelphia chromosome [18].

The management involves the use of medication, such as tyrosine kinase inhibitors (TKIs), which target the genetic changes that drive the disease [19]. Imatinib, dasatinib, nilotinib, and bosutinib are examples of TKIs that are commonly used to treat CML [20].

The aim of the study was to evaluate the demographic and clinical features of CML in Asmara, Eritrea.

II. Material And Methods

A descriptive retrospective cross-sectional study was conducted to study the socio-demographic characteristics and presenting features of CML diagnosed at a central Laboratory in Asmara, Eritrea, from December 2015 to July 2017. The study included all cases confirmed with a diagnosis of CML during that period. The study data was collected from the patient's medical records using a questionnaire structured by the author. Patient files with complete information on variables including gender, age, and diagnosis were included in the study, while those with incomplete information were excluded.

The diagnosis of CML was based on the presence of increased granulocytes in the peripheral blood smear and the presence of the Philadelphia chromosome in the bone marrow or peripheral blood. Also, specific study case data were obtained based on age, gender, presenting complaints, and physical exam findings. All data collected was edited, coded, and analyzed using the Statistical Package for the Sciences V. 22.0 (SPSS, Armonk, NY: IBM Corp). The procedures followed were in accordance with the ethical standards of the responsible committee for human experimentation.

III. Results

Out of 204 cases, (8.3%) were confirmed with the diagnosis of CML. 52.9% of CML patients were male, with a 1.125:1 male-to-female ratio. The age of patients with CML ranged from 11 to 74 years old, with a median age of 48 years.

Most of the patients suffering from CML were aged 41-60 years (41.2%), followed by those between 21-40 years (29.4%), while those aged 61-80 years were the last affected (11.8%). More details are shown in Table 1.

Table no 1: Socio-demographic characteristics of the patients.

Social Character	Chronic myeloid leukemia No. (%)	Total No. (%)
Gender		
Male	9 (52.9%)	9 (52.9%)
Female	8 (47.1%)	8 (47.1%)
Age		
0-20 years	3	3 (17.6%)
21-40 years	5	5 (29.4%)
41-60 years	7	7 (41.2%)
61-80 years	2	2 (11.8 %)
Total	17	17 (100%)

The most common symptoms reported by the patients were abdominal pain/distention (29.4%), fever (25.2%), and weakness/fatigue (29.4%). Other symptoms reported were weight loss (17.4%), headache (17.4%), pallor (5.9%), bleeding diathesis (5.9%), All the patients had splenomegaly (100%), and 17.4% had hepatomegaly, none of the patients had an absence of organomegaly. Table 2.

Table no 2: Clinical characteristics of the patients

	Chronic myeloid leukemia	Percentage (%)
Fever	4	25.2 %
Pallor	1	5.9%
Bleeding diathesis	1	5.9%
Abdominal pain/distention	5	29.4 %
Weight loss	3	17.4 %
GBW/fatigue	5	29.4 %

Headache	3	17.4 %
Splenomegaly	17	100 %
Hepatomegaly	3	17.4 %
Absence of organomegaly	0	0.0 %

The complete blood count and peripheral blood smear revealed that most of the patients had an increased number of white blood cells, basophilia with an increased number of eosinophils in a few patients. The Philadelphia study results were also positive in all cases.

IV. Discussion

The study described the socio-demographic and clinical presentation characteristics of patients with CML in Asmara, Eritrea. The results showed that 8.3% of the cases reviewed were diagnosed with CML.

The study discovered that the majority of CML patients are male, with a 1:1.1 female-to-male ratio, and a median age of 48. These results align with other studies conducted in Sudan [13]. Some studies in the United States of America [21] and the United Kingdom [22] have shown a higher median age, which could stem from a small sample size, cultural and genetic differences, or Eritrea's younger population.

The study findings regarding the symptoms of CML patients in Eritrea are consistent with those found in other studies conducted in India [23] and China [24] found that the most common symptoms reported by CML patients were fever, abdominal pain/distention, and weakness/fatigue. However, there are also some differences in symptoms between our study and a study conducted in Pakistan found that the most common symptoms reported by CML patients were fatigue, weight loss, and night sweats [25].

The study found that all patients with CML had splenomegaly, with 17.4% also having hepatomegaly. This is consistent with studies conducted in India [23], China [24], and Pakistan [25], which found that splenomegaly is commonly reported in CML patients, with a smaller percentage having hepatomegaly.

According to the study findings, most patients with CML had an elevated white blood cell count and basophilia. These findings align with those from other studies conducted in India [23] and China [24], which also found similar results, with a smaller percentage of CML patients showing increased numbers of eosinophils.

The study has limitations such as a short study period, a limited sample size that could hinder the generalizability of the findings, and a single-center design that may not properly depict the entire Eritrean population.

V. CONCLUSION

The study provides important insights into the socio-demographic and clinical presentation characteristics of CML patients in Eritrea. We found that CML is more prevalent in males than females, with most patients being between the ages of 41-60 years. The most reported symptoms were abdominal pain/distension, followed by fever. Clinical examination revealed that splenomegaly was present in all patients, while hepatomegaly was observed in 17.4% of the patients.

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