Difference Between CML and CLL

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Key Difference – CML vs CLL

Leukemia can be described in lay terms as the malignancies of blood. However, in reality, the origin of leukemia happens in the bone marrows where the precursor stem cells that produce various blood cells lie. CML (Chronic Myeloid Leukemia) and CLL (Chronic Lymphocytic Leukemia) are two such varieties of leukemia that occur due to abnormalities in the stem cells in the bone marrows. CML is a member of the family of myeloproliferative neoplasms whereas CLL is the commonest type of leukemia whose pathological basis is the clonal expansion of B cells. **In CML, the malignant cells are granulocytes or myelocytes while in CLL, lymphocytes are the blood cells that have the malignant features.** This is the key difference between CML and CLL.

What is CML?

CML **(Chronic Myeloid Leukemia)** is a member of the family of myeloproliferative neoplasms which occurs exclusively in adults. It is defined by the presence of the Philadelphia chromosome and has a more slowly progressive course than acute leukemia.

Clinical Features

- Symptomatic anemia
- Abdominal discomfort
- Weight loss
- Headache
- Bruising and bleeding
- Lymphadenopathy

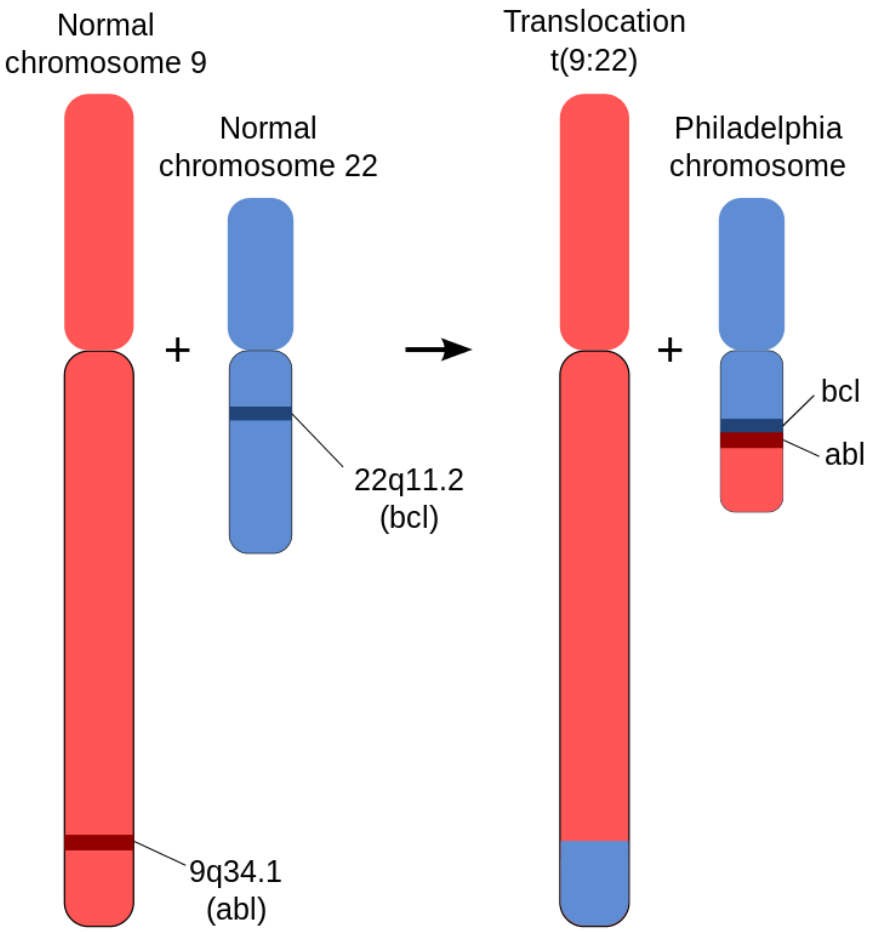

Figure 01: Formation of Philadelphia Chromosome

Investigations

- Blood counts – Hemoglobin is low or normal. Platelets are low, normal or raised. WBC count is elevated.
- Presence of mature myeloid precursors in blood film
- Increased cellularity with increased myeloid precursors in bone marrow aspirate.

Management

First line drug in the treatment of CML is Imatinib(Glivec), which is a tyrosine kinase inhibitor. Second line treatments include chemotherapy with hydroxyurea, alpha interferon, and allogeneic stem cell transplantation.

What is CLL?

CLL **(Chronic Lymphocytic Leukemia)** is the commonest form of leukemia, and it often occurs in elderly people. The clonal expansion of small B lymphocytes is the pathological basis of this condition.

Clinical Features

- Asymptomatic lymphocytosis
- Lymphadenopathy
- Marrow failure
- Hepatosplenomegaly
- B-symptoms

Investigations

- Very high white blood cell levels can be seen in blood counts
- Smudge cells can be seen in blood film

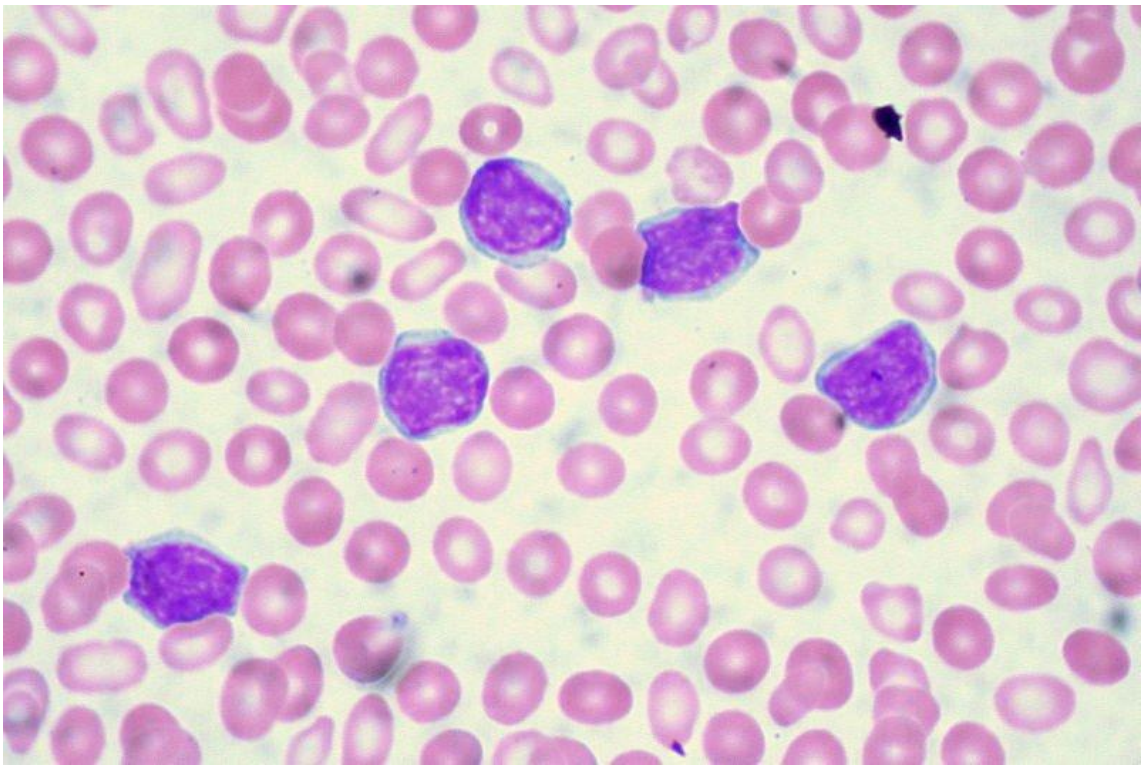

Figure 02: Chronic Lymphocytic Leukemia (CLL)

Management

Treatment is given to troublesome organomegaly, hemolytic episodes, and bone marrow suppression. Rituximab in combination with Fludarabine and cyclophosphamide show a dramatic response rate.

What is the Similarity Between CML and CLL?

- Both CML and CLL are malignancies with a slow rate of spread.

What is the Difference Between CML and CLL?

CML vs CLL	
CML is a member of the family of myeloproliferative neoplasms which exclusively occur in adults. It is defined by the presence of the Philadelphia chromosome.	CLL is the commonest form of leukemia, and it occurs in elderly people most of the time. The clonal expansion of small B lymphocytes is the pathological basis of this condition.
Cancerous Cells	
Granulocytes are the cancerous cells.	Lymphocytes are the cancerous cells.
Clinical Features	
Clinical features of CML are, · Symptomatic anemia · Abdominal discomfort · Weight loss · Headache · Bruising and bleeding	Clinical features of CLL are, · Asymptomatic lymphocytosis · Lymphadenopathy · Marrow failure · Hepatosplenomegaly · B-symptoms

· Lymphadenopathy	
Diagnosis	
· Hemoglobin is low or normal. · Platelets are low, normal or raised. WBC count is elevated. · Mature myeloid precursors are present in blood films. · Increased cellularity with increased myeloid precursors in bone marrow aspirate.	Very high white blood cell levels can be seen in blood counts. Smudge cells can be observed in blood films.
Management	
Treatment is given to troublesome organomegaly, hemolytic episodes, and bone marrow suppression. Rituximab in combination with Fludarabine and cyclophosphamide show a dramatic response rate.	First line drug in the treatment of CML is Imatinib(Glivec), which is a tyrosine kinase inhibitor. Second line treatments include chemotherapy with hydroxyurea, alpha interferon, and allogeneic stem cell transplantation.

Summary – CML vs CLL

CML or Chronic Myeloid Leukemia is one variety of leukemia that is most often seen among adults. On the other hand, Chronic Lymphocytic Leukemia (CLL) is another variety of leukemia whose pathological basis is the abnormalities in the clonal expansion of B lymphocytes. The main difference between CML and CLL is that in CML, granulocytes are the malignant cells but lymphocytes are the malignant cells in CLL.

References:

1. Kumar, Parveen J., and Michael L. Clark. Kumar & Clark clinical medicine. Edinburgh: W.B. Saunders, 2009. Print.

Image Courtesy:

1. “Schematic of the Philadelphia Chromosome” By Aryn89 – Own work (CC BY-SA 4.0) via Commons Wikimedia
2. “Chronic Lymphocytic Leukemia” By Ed Uthman – originally posted to Flickr as Chronic Lymphocytic Leukemia, (CC BY-SA 2.0) via Commons Wikimedia

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