

**PHB**



**Dr. Arvind Kumar Gupta**  
(M.Pharm, PDCR, PGDMM & Ph.D)  
GATE 2003 Qualified with 97.2 percentile  
Dr. S. N. Dev College of Pharmacy  
Shamli (U.P.)

**OFFICE:** BUILDING No. 3/314, OFFICE-1, GAUSHALA ROAD, SHAMLI DISTRICT SHAMLI (U.P.) – 247776

**Mobile:** +91-9719638415

**Email:** arindrkgit@gmail.com

**Course Name : D. Pharm**  
**Year : Second Year**  
**Subject Name : Pharmacotherapeutics**  
**Topic Name : Megaloblastic anaemia**

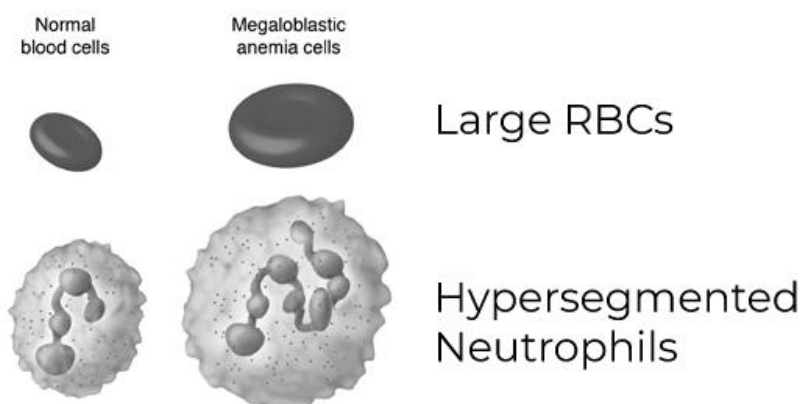
## Chapter– 7 Haematological Disorders

### Topic: MEGALOBLASTIC ANAEMIA

#### 7.1

#### Introduction

Haematological disorders are conditions that affect the blood and blood-forming organs. Here's a comprehensive overview of haematological disorders:



#### 7.2

#### Etiopathogenesis

Some of the common causes include:

- 1. Genetic mutations:** Many haematological disorders are caused by genetic mutations, such as sickle cell anaemia and thalassemia.
- 2. Environmental factors:** Exposure to certain environmental factors, such as radiation and chemicals, can increase the risk of developing haematological disorders.
- 3. Infections:** Certain infections, such as human immunodeficiency virus (HIV) and hepatitis, can increase the risk of developing haematological disorders.
- 4. Autoimmune disorders:** Certain autoimmune disorders, such as rheumatoid arthritis and lupus, can increase the risk of developing haematological disorders.

## 7.3

## Types

- 1. Anaemia:** A condition characterized by a decrease in the number of red blood cells or the amount of haemoglobin in the blood.
- 2. Bleeding Disorders:** Conditions that affect the blood's ability to clot, such as haemophilia A and B, and von Willebrand disease.
- 3. Blood Cancers:** Cancers that affect the blood and blood-forming organs, such as leukaemia, lymphoma, and myeloma.
- 4. Bone Marrow Failure:** Conditions that affect the bone marrow's ability to produce blood cells, such as aplastic anaemia and myelodysplastic syndromes.
- 5. Coagulation Disorders:** Conditions that affect the blood's ability to clot, such as thrombophilia and antiphospholipid syndrome.
- 6. Haemolytic Anaemia:** Conditions that affect the red blood cells, causing them to break down prematurely, such as sickle cell anaemia and thalassemia.
- 7. Myeloproliferative Neoplasms:** Conditions that affect the bone marrow's ability to produce blood cells, such as polycythaemia vera and essential thrombocythaemia.

## 7.4

## Symptoms

The symptoms commonly includes:

- 1. Fatigue:** Many haematological disorders can cause fatigue, which can range from mild to severe.
- 2. Weakness:** Haematological disorders can cause weakness, which can affect the muscles and other parts of the body.
- 3. Shortness of breath:** Certain haematological disorders, such as anaemia, can cause shortness of breath.
- 4. Bruising and bleeding:** Haematological disorders can cause bruising and bleeding, which can range from mild to severe.
- 5. Infections:** Certain haematological disorders, such as neutropenia, can increase the risk of developing infections.

## 7.5

## Diagnosis

Diagnostic procedures may include:

- 1. Complete Blood Count (CBC):** A CBC is a blood test that measures the different components of the blood, including red and white blood cells and platelets.

- 2. Blood Smear:** A blood smear is a test that examines the blood cells under a microscope.
- 3. Bone Marrow Biopsy:** A bone marrow biopsy is a test that examines the bone marrow and blood cells.
- 4. Genetic Testing:** Genetic testing can be used to diagnose certain haematological disorders, such as sickle cell anaemia and thalassemia.

**7.6****Pharmacological managements**

Medications:

- 1. Medications:** Medications, such as antibiotics and anticoagulants, can be used to treat haematological disorders.
- 2. Blood Transfusions:** Blood transfusions can be used to treat anaemia and other haematological disorders.
- 3. Bone Marrow Transplantation:** Bone marrow transplantation can be used to treat certain haematological disorders, such as leukaemia and lymphoma.
- 4. Surgery:** Surgery can be used to treat certain haematological disorders, such as splenectomy (removal of the spleen).

**7.7****Non - Pharmacological managements**

Non-pharmacological management of haematological disorders includes:

- 1. Dietary changes:** Eating a healthy, balanced diet that is rich in fruits, vegetables, and whole grains can help manage haematological disorders.
- 2. Exercise:** Regular exercise can help improve overall health and reduce the risk of complications.
- 3. Stress management:** Stress can exacerbate haematological disorders, so finding healthy ways to manage stress, such as through meditation or yoga, is important.
- 4. Avoiding triggers:** Avoiding triggers, such as certain foods or environmental factors, can help manage haematological disorders.
- 5. Blood transfusions:** Blood transfusions may be necessary to manage certain haematological disorders, such as anaemia.

**7.8****Complications****Blood-Related Complications**

- 1. Anaemia:** Reduced red blood cell count or haemoglobin level, leading to fatigue, weakness, and shortness of breath.

2. Bleeding and bruising: Impaired blood clotting, leading to prolonged bleeding and bruising.
3. Thrombosis: Blood clots forming in veins or arteries, leading to stroke, heart attack, or pulmonary embolism.
4. Sepsis: Life-threatening infection that can occur due to impaired immune function.

### **Organ-Related Complications**

1. Kidney damage: Haematological disorders can lead to kidney damage or failure.
2. Liver damage: Certain haematological disorders, such as haemochromatosis, can lead to liver damage or failure.
3. Heart problems: Haematological disorders can increase the risk of heart problems, such as heart failure or arrhythmias.
4. Lung problems: Certain haematological disorders, such as sickle cell disease, can lead to lung damage or failure.

### **Cancer-Related Complications**

1. Leukaemia: Certain haematological disorders, such as myelodysplastic syndromes, can increase the risk of developing leukaemia.
2. Lymphoma: Certain haematological disorders, such as autoimmune disorders, can increase the risk of developing lymphoma.

### **Neurological Complications**

1. Stroke: Haematological disorders can increase the risk of stroke.
2. Seizures: Certain haematological disorders, such as thrombotic thrombocytopenic purpura, can cause seizures.
3. Cognitive impairment: Certain haematological disorders, such as sickle cell disease, can cause cognitive impairment.

### **Other Complications**

1. Osteoporosis: Certain haematological disorders, such as multiple myeloma, can increase the risk of osteoporosis.
2. Infections: Haematological disorders can increase the risk of infections, particularly in people with impaired immune function.
3. Psychological distress: Haematological disorders can cause significant psychological distress, including anxiety and depression.

## Practice Questions

### MULTIPLE CHOICE QUESTIONS

1. What is the primary cause of megaloblastic anemia?
  - A) Iron deficiency
  - B) Folate deficiency
  - C) Vitamin B12 deficiency
  - D) Hemolytic anemia
2. Which of the following is a characteristic feature of megaloblastic anemia?
  - A) Microcytic red blood cells
  - B) Hypochromic red blood cells
  - C) Hypersegmented neutrophils
  - D) Elevated reticulocyte count
3. Megaloblastic anemia is characterized by ineffective erythropoiesis due to:
  - A) Folate toxicity
  - B) Vitamin B12 toxicity
  - C) Defective DNA synthesis
  - D) Excessive iron absorption
4. Which diagnostic test is commonly used to confirm megaloblastic anemia?
  - A) Serum ferritin level
  - B) Hemoglobin electrophoresis
  - C) Schilling test
  - D) Serum vitamin B12 level
5. Megaloblastic anemia is often associated with neurological symptoms due to:
  - A) Impaired hemoglobin synthesis
  - B) Decreased oxygen transport
  - C) Myelin degeneration
  - D) Elevated reticulocyte count
6. Treatment of megaloblastic anemia typically involves supplementation of:
  - A) Iron
  - B) Folate

- C) Vitamin C  
D) Vitamin D
7. Pernicious anemia, a type of megaloblastic anemia, is primarily caused by:
- A) Folate deficiency  
B) Vitamin B12 deficiency  
C) Iron overload  
D) Hemolysis
8. Which dietary source is rich in vitamin B12?
- A) Leafy greens  
B) Citrus fruits  
C) Red meat  
D) Whole grains
9. The Schilling test is used to diagnose the cause of megaloblastic anemia by assessing: A) Vitamin B12 absorption  
B) Folate absorption  
C) Iron absorption  
D) Reticulocyte count
10. Complications of untreated megaloblastic anemia may include:
- A) Hypertension  
B) Osteoporosis  
C) Cardiovascular disease  
D) Neurological damage

**FILL IN THE BLANKS**

1. The most common cause of megaloblastic anemia is a deficiency in \_\_\_\_\_.  
**(Vitamin B12)**
2. Symptoms of megaloblastic anemia can include fatigue, weakness, pale skin, shortness of breath, and \_\_\_\_\_. **(Glossitis)**
3. Vitamin B12 is essential for the production of \_\_\_\_\_, which are necessary for normal RBC formation. **(DNA)**
4. Treatment for megaloblastic anemia often involves \_\_\_\_\_ supplementation.  
**(Vitamin)**
5. Megaloblastic anemia can be diagnosed through \_\_\_\_\_ tests, which show enlarged and abnormally shaped RBCs. **(Blood smear)**



**SHORT ANSWER TYPE QUESTIONS**

1. Define megaloblastic anemia?
2. Explain the role of vitamin B12 in the pathogenesis of megaloblastic anemia.
3. Describe the Schilling test and its significance in diagnosing megaloblastic anemia.
4. What neurological complications can arise from untreated megaloblastic anemia?
5. How is megaloblastic anemia treated?

**LONG ANSWER TYPE QUESTIONS**

1. Discuss the etiology and pathophysiology of megaloblastic anemia.
2. Compare the megaloblastic anemia caused by vitamin B12 deficiency and folate deficiency.
3. Explain the role of intrinsic factor and parietal cells in the absorption of vitamin B12.
4. Describe the diagnostic approach to megaloblastic anemia.
5. Discuss the complications that can arise from prolonged untreated megaloblastic anemia.

---

**MCQ Answer**

<b>1.</b>	<b>C</b>	<b>3.</b>	<b>C</b>	<b>5.</b>	<b>C</b>	<b>7.</b>	<b>B</b>	<b>9.</b>	<b>A</b>
<b>2.</b>	<b>C</b>	<b>4.</b>	<b>D</b>	<b>6.</b>	<b>B</b>	<b>8.</b>	<b>C</b>	<b>10.</b>	<b>D</b>

---