Journal of Interdisciplinary Histopathology, 2022
VOL 10, NO. 4, PAGE 01

Perspective

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Hemolyic Anemia and its Causes

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ARTICLE HISTORY
Received: 01-Apr-2022, Manuscript No. EJMJIH-22-60131;
Editor assigned: 04-Apr-2022, PreQC No. EJMJIH-22-60131 (PQ);
Reviewed: 18-Apr-2022, QC No. EJMJIH-22-60131;
Revised: 25-Apr-2022, Manuscript No. EJMJIH-22-60131 (R);
Published: 02-May-2022.

Description

Haemolytic anaemia is a condition in which the body destroys red blood cells quicker than they can be produced. Haemolysis is the term for the breakdown of red blood cells. Red blood cells are responsible for transporting oxygen throughout your body. Anaemia is a condition in which the number of red blood cells in your body is fewer than usual.

Hemolytic anaemia is a kind of anaemia that can be inherited or acquired.

• Inherited hemolytic anaemia occurs when a parent passes the hemolytic anaemia gene to their children.

• Hemolytic anaemia is a condition that is acquired rather than inherited. Later on, you develop the ailment.

Hemolytic anaemia symptoms can mimic those of other blood disorders or health issues.

• A complete blood count is required (CBC). This test examines several aspects of your blood.

• Additional blood tests if your CBC test indicates that you have anaemia, you may need to have additional blood testing. These tests can determine the type of anaemia you have and the severity of your condition.

• Urine examination. This can be used to check haemoglobin and iron levels.

• A biopsy or aspiration of the bone marrow a small sample of bone marrow fluid (aspiration) or solid bone marrow tissue is taken. Typically, a sample is collected from the hip bones. The quantity, size, and maturity of the insects are all examined blood cells or abnormal cells.

Anaemia is a condition in which the amount of healthy red blood cells in the body is insufficient. Red blood cells are responsible for transporting oxygen throughout the body.

Red blood cells normally live about 120 days in the body. Red blood cells in the blood are damaged earlier than usual in hemolytic anaemia.

Causes

The bone marrow is primarily responsible for the production of new red blood cells. The soft tissue in the middle of bones, called bone marrow, aids in the formation of all blood cells.

When the bone marrow does not produce enough red cells to replace the ones that are killed, hemolytic anaemia develops.

Hemolytic anaemia can be caused by a variety of factors. It's possible that red blood cells will be destroyed as a result of:

• An autoimmune disorder in which the immune system misidentifies and destroys your own red blood cells as alien entities.

• Toxic exposure to chemicals, medicines, and other poisons.

• Genetic abnormalities in red cells (such as sickle cell anaemia, thalassemia, and G6PD deficiency).

• Infections

• Blood clots in the capillaries of the tiny blood vessels.

• Transfusion of blood from a donor who does not have the same blood type as you.

Acute or chronic anaemia, reticulocytosis, or jaundice is all symptoms of hemolysis. Reticulocytosis, increased unconjugated bilirubin and lactate dehydrogenase, reduced haptoglobin, and peripheral blood smear abnormalities are used to make the diagnosis. Erythrocytes are destroyed prematurely either intravascular or extravascular. The causes of haemolysis are frequently classified as acquired or hereditary. Autoimmunity, microangiopathy, and infection are all common acquired causes of hemolytic anaemia. Antierythrocyte antibodies pro-

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duce immune-mediated hemolysis, which can be caused by malignancies, autoimmune illnesses, medications, or transfusion responses. When the red cell membrane is disrupted in circulation, it causes intravascular hemolysis and the formation of schistocytes, which is known as microangiopathic hemolytic anaemia. Malaria and babesiosis are two infectious diseases that attack red blood cells. Hereditary hemolytic anemias are caused by problems with red blood cell enzymes, membranes, and haemoglobin. In the context of oxidative stress, glucose-6-phosphate dehydrogenase deficiency causes hemolysis. Spherocytosis, a family history, and a negative direct antiglobulin test are all symptoms of hereditary spherocytosis. Chronic hemolysis characterises hemoglobinopathies such as sickle cell anaemia and thalassemia.

Hemolysis occurs when red blood cells are destroyed or removed from circulation before their typical lifespan of 120 days. While hemolysis might be asymptomatic for a long time, it most commonly manifests as anaemia when erythrocytosis is unable to keep up with the rate of red cell breakdown. Jaundice, cholelithiasis, and isolated reticulocytosis are all symptoms of hemolysis.

Pathophysiology

Hemolysis is caused by two different methods. Intravascular hemolysis occurs when red blood cells are destroyed in the circulation and their contents are released into the plasma. Direct membrane breakdown and cell death can be caused by mechanical trauma from a compromised endothelium, complement fixation and activation on the cell surface, and infectious pathogens.

The removal and destruction of red blood cells by spleen and liver macrophages with membrane changes is the more common extravascular hemolysis. The splenic sinusoids, a sponge like labyrinth of macrophages with long dendritic processes, filter circulating blood constantly through thin-walled splenic cords. A normal 8-micron red blood cell can deform and pass through the splenic cords' 3-micron holes. Red blood cells having membrane surface structural changes are unable to pass through this network and are phagocytosed and killed by macrophages.