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BLOOD DISEASES

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ABSTRACT: Blood is a viscous fluid formed of cellular elements suspended in plasma. The cellular element composed of red blood cell, white blood cell and platelets. Plasma is a viscous and translucent Yellow fluid composition of water proteins inorganic Salts and organic compounds such as amino acids liquids and vitamins. Bleeding disorders are divided into two broad categories that is inherited and acquired. In contrast to inherited haemorrhagic diseases generally a single hemostatic abnormality is found multiple hemostatic defects are commonly present in acquired haemorrhagic diseases. Blood disorders in lupus include anemia and platelet disorders and white blood cell disorders and clotting disorders. The most common types of anemia are anemia of chronic disease and iron deficiency anemia and hemolytic anemia. Commonly encountered platelet disorders include antiphospholipid syndrome. These disorders are important to be aware of because they are commonly and counted in patients they may even be presenting features of the diseases. Genetic blood disorders are a group of disorders that are passed down from parents to their children.

KEYWORDS: Introduction, blood,blood diseases,anemia, hemochromatosis,iron deficiency anemia, sickle cell disease, thalassemias, porphyria, thromboticthrombocytopenic purpura, bleeding disorders, conclusion

I. INTRODUCTION

Blood is a collection of cells that have been specialized to perform a set of tasks within an organism. Blood is a tissue and consists of Plasma and cells. Blood is a connective tissue that consists of cell suspended in liquid Matrix . Blood count changes according to the lifestyle of a patient and increases and decreases among the various disorders. Increased blood count cause hyperplasia and decreased blood count cause anemic conditions. There are about 1 billion red blood cells in 2-3 drops of blood and for every 600 red blood cells there are about 40 platelets and onee white cell. Monitoring blood count decrease fat all conditions.[1,2]

II. BLOOD

Book blood is a viscous fluid formed of cellular elements suspended in plasma. The cellular element composed of erythrocytes (red blood cells) leukocytes (white blood cells) and platelets. Plasma is a viscous transmission fluid composed of water of 90% proteins of 7% organic salts of 1% an organic compound 2% such as amino acids, lipids and vitamins. The total body volume in human is about 5 years depending upon the body size. Outside the blood vessels blood undergoes a complex reaction called coagulation or clot formation which plays an important role in repairing damaged blood vessels and preventing blood loss.[3]

III. BLOOD DISEASES

A) Anemia

Anemia NIH external link is a condition in which your blood has a lower-than-normal amount of red blood cells or hemoglobin. Hemoglobin is the iron NIH external link-rich protein that allows red blood cells to carry oxygen from your lungs to the rest of your body. With fewer red blood cells or less hemoglobin, your tissues and organs—such as your heart and brain—may not get enough oxygen to work properly.

Causes

Anemia in people with CKD often has more than one cause.

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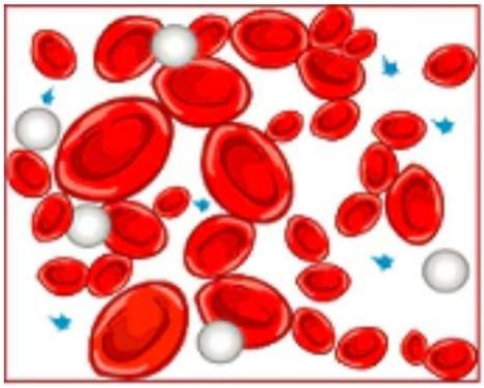
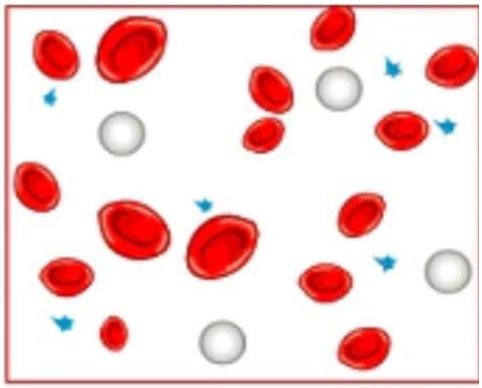
When your kidneys are damaged, they produce less erythropoietin (EPO), a hormone that signals your bone marrow—the spongy tissue inside most of your bones—to make red blood cells. With less EPO, your body makes fewer red blood cells, and less oxygen is delivered to your organs and tissues.
In addition to your body making fewer red blood cells, the red blood cells of people with anemia and CKD tend to live in the bloodstream for a shorter time than normal, causing the blood cells to die faster than they can be replaced.
People with anemia and CKD may have low levels of nutrients, such as iron, vitamin B12 NIH external link, and folate NIH external link, that are needed to make healthy red blood cells.
Other causes of anemia related to CKD include
Blood loss, particularly if you are treated with dialysis for kidney failure
Infection
Inflammation
Malnutrition, a condition that occurs when the body doesn't get enough nutrient[4,5]



Normal blood.



Anemia

B) Hemochromatosis

Hemochromatosis is a disorder in which extra iron NIH external link builds up in the body to harmful levels.Your body needs iron to stay healthy, make red blood cells, build muscle and heart cells, and do the daily tasks that your body and internal organs need to do. However, too much iron is harmful.The human body typically controls the amount of iron that is absorbed from the diet, increasing the amount when iron is needed and decreasing the amount when iron levels in the body are too high. In hemochromatosis, the body absorbs too much iron from the diet each day.Without treatment, hemochromatosis can cause iron overload, a buildup of iron that can damage many parts of the body, including the liver, heart, pancreas, endocrine glands, and joints.

Causes

Mutations NIH external link in genes that control how the body absorbs iron cause primary hemochromatosis. The most common mutations are in the HFE NIH external link genes and are called C282Y and H63D.
The important HFE mutations are autosomal recessive NIH external link, meaning that a person must inherit two copies of the HFE gene with the mutation to have hemochromatosis. The most common pattern in primary hemochromatosis occurs with two copies of C282Y. Two copies of C282Y are present in about 85 to 90 percent of cases of primary hemochromatosis.6 A less common pattern that leads to milder iron overload is caused by having one copy of C282Y and one of H63D.
Mutations in other genes that control how the body manages iron levels cause 10 to 15 percent of cases of primary hemochromatosis.3 These rare forms are called non-HFE hemochromatosis. The most severe forms of non-HFE hemochromatosis are due to mutations in the HJV NIH external link genes or the HAMP NIH external link genes. People with these mutations develop symptoms and complications at a young age and may have cirrhosis and other complications from iron overload by their teenage years.[6,7]

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C) Iron-Deficiency Anemia

Iron-deficiency anemia is a common type of anemia that occurs if you do not have enough iron in your body. People with mild or moderate iron-deficiency anemia may not have any signs or symptoms. More severe iron-deficiency anemia may cause fatigue or tiredness, shortness of breath, or chest pain.If your doctor diagnoses you with iron-deficiency anemia, your treatment will depend on the cause and severity of the condition. Your doctor may recommend healthy eating changes, iron supplements, intravenous iron therapy for mild to moderate iron-deficiency anemia, or red blood cell transfusion for severe iron-deficiency anemia. You may need to address the cause of your iron deficiency, such as any underlying bleeding. If undiagnosed or untreated, iron-deficiency anemia can cause serious complications, including heart failure and development delays in children.

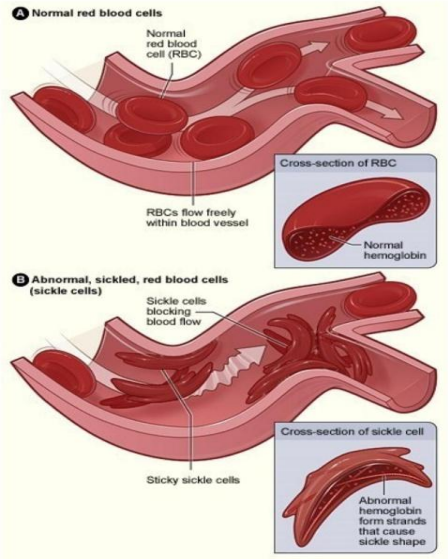
Causes

Your body needs iron to make healthy red blood cells. Iron-deficiency anemia usually develops over time because your body's intake of iron is too low. Low intake of iron can happen because of blood loss, consuming less than the recommended daily amount of iron, and medical conditions that make it hard for your body to absorb iron from the gastrointestinal tract (GI tract).

Treatment

Treatment for iron-deficiency anemia will depend on its cause and severity. Treatments may include iron supplements, procedures, surgery, and dietary changes. Severe iron-deficiency anemia may require intravenous (IV) iron therapy or a blood transfusion.[8,9]

D) Sickle Cell Disease



Sickle cell disease is a group of inherited red blood cell disorders that affects hemoglobin, the protein that carries oxygen through the body. Normally, red blood cells are disc shaped and flexible to move easily through the blood vessels. If you have sickle cell disease, your red blood cells are crescent or "sickle" shaped. These cells do not bend and move easily and can block blood flow to the rest of your body.Sickle cell disease is a lifelong illness. A blood and bone marrow transplant is currently the only cure for sickle cell disease, but there are effective treatments that can reduce symptoms and prolong life.Your healthcare team will work with you on a treatment plan to reduce your symptoms and manage the condition. The NHLBI is leading and supporting research and clinical trials to find a cure for sickle cell disease.

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Causes
Abnormal hemoglobin, called hemoglobin S, causes sickle cell disease.Sickle cell disease is a genetic disorder caused by mutations in the beta globin gene that leads to faulty hemoglobin protein, called hemoglobin S. Hemoglobin S changes flexible red blood cells into rigid, sickle-shaped cells. These sickle cells can block blood flow, and result in pain and organ damage. [10,11]

E) Thalassemias

Thalassemias (thal-a-SE-me-ahs) are inherited blood disorders. "Inherited" means that the disorder is passed from parents to children through genes.Thalassemias cause the body to make fewer healthy red blood cells and less hemoglobin (HEE-muh-glow-bin) than normal. Hemoglobin is an iron-rich protein in red blood cells. It carries oxygen to all parts of the body. Hemoglobin also carries carbon dioxide (a waste gas) from the body to the lungs, where it's exhaled.People who have thalassemias can have mild or severe anemia (uh-NEE-me-uh). Anemia is caused by a lower than normal number of red blood cells or not enough hemoglobin in the red blood cells.
Causes
Your body makes three types of blood cells: red blood cells, white blood cells, and platelets (PLATE-lets). Red blood cells contain hemoglobin, an iron-rich protein that carries oxygen from your lungs to all parts of your body. Hemoglobin also carries carbon dioxide (a waste gas) from your body to your lungs, where it's exhaled.
Hemoglobin has two kinds of protein chains: alpha globin and beta globin. If your body doesn't make enough of these protein chains or they're abnormal, red blood cells won't form correctly or carry enough oxygen. Your body won't work well if your red blood cells don't make enough healthy hemoglobin.Genes control how the body makes hemoglobin protein chains. When these genes are missing or altered, thalassemias occur.
Thalassemias are inherited disorders—that is, they're passed from parents to children through genes. People who inherit faulty hemoglobin genes from one parent but normal genes from the other are called carriers. Carriers often have no signs of illness other than mild anemia. However, they can pass the faulty genes on to their children.People who have moderate to severe forms of thalassemia have inherited faulty genes from both parents. [12,13]

F) Porphyria

Porphyrias are rare disorders that mainly affect the skin or nervous system. These disorders are usually inherited, meaning they are caused by gene mutations NIH external link passed from parents to children.If you have porphyria, cells fail to change chemicals in your body—called porphyrins and porphyrin precursors—into heme, the substance that gives blood its red color. When these chemicals build up in your body, they cause illness. Depending on the type of porphyria you have, porphyrins or porphyrin precursors may build up in the liver or the bone marrow. Bone marrow is the spongy tissue inside most of your bones.
Causes
Most types of porphyrias are caused by gene mutations. Some types of porphyrias result from inheriting NIH external link a gene mutation from one parent, while other types result from inheriting two gene mutations, one from each parent.Many people with gene mutations for acute porphyrias never develop the disease. In people who have these gene mutations, factors that increase the chance of developing acute porphyria attacks or make attacks worse include

- Female sex hormones, especially progesterone
- Some medicines, including hormonal types of birth control NIH external link and certain types of antibiotics NIH external link, anesthetics NIH external link, and anticonvulsants—medicines designed to treat seizures
- Lowered intake of carbohydrates, due to fasting, dieting, illness, or bariatric surgery
- Drinking alcohol, especially binge drinking, which the 2015–2020 Dietary Guidelines for Americans External link defines as having four or more drinks within about 2 hours for women and having five or more drinks within about 2 hours for men
- Smoking

The most common type of porphyria, porphyria cutanea tarda, is most often acquired, meaning that factors other than inherited genes may cause this condition. These factors may include

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- A buildup of iron in the body, which may be caused by gene mutations that can lead to hemochromatosis
- Heavy alcohol use, which the 2015–2020 Dietary Guidelines for Americans defines as 15 or more drinks per week for men and 8 or more drinks per week for women
- Viral infections, such as hepatitis C and HIV NIH external link infectionstaking estrogen, which may be found in medicines such as birth control pills NIH external link and hormonal replacement therapy. [14,15,16]

G) Thrombotic Thrombocytopenic Purpura

Thrombotic thrombocytopenic purpura (TTP) is a rare blood disorder. In TTP, blood clots form in small blood vessels throughout the body.The clots can limit or block the flow of oxygen-rich blood to the body's organs, such as the brain, kidneys, and heart. As a result, serious health problems can develop.
The increased clotting that occurs in TTP also uses up platelets (PLATE-lets) in the blood. Platelets are blood cell fragments that help form blood clots. These cell fragments stick together to seal small cuts and breaks on blood vessel walls and stop bleeding.With fewer platelets available in the blood, bleeding problems can occur. People who have TTP may bleed inside their bodies, underneath the skin, or from the surface of the skin. When cut or injured, they also may bleed longer than normal.
"Thrombotic" (throm-BOT-ik) refers to the blood clots that form. "Thrombocytopenic" (throm-bo-cy-toe-PEE-nick) means the blood has a lower than normal number of platelets. "Purpura" (PURR-purr-ah) refers to purple bruises caused by bleeding under the skin.Bleeding under the skin also can cause tiny red or purple dots on the skin. These pinpoint-sized dots are called petechiae (peh-TEE-kee-ay). Petechiae may look like a rash.

Causes

A lack of activity in the ADAMTS13 enzyme (a type of protein in the blood) causes thrombotic thrombocytopenic purpura (TTP). The ADAMTS13 gene controls the enzyme, which is involved in blood clotting.Not having enough enzyme activity causes overactive blood clotting. In TTP, blood clots form in small blood vessels throughout the body. These clots can limit or block the flow of oxygen-rich blood to the body's organs, such as the brain, kidneys, and heart. As a result, serious health problems can develop.The increased clotting that occurs in TTP also uses up many of the blood's platelets. With fewer platelets available in the blood, bleeding problems can occur.People who have TTP may bleed inside their bodies, underneath the skin, or from the surface of the skin. When cut or injured, they also may bleed longer than normal.TTP also can cause red blood cells to break apart faster than the body can replace them. This leads to hemolytic anemia. [17,18]

H) Bleeding Disorders

Bleeding disorders are rare disorders affecting the way the body controls blood clotting. If your blood does not clot normally, you may experience problems with bleeding too much after an injury or surgery. This health topic will focus on bleeding disorders that are caused by problems with clotting factors, including hemophilia and von Willebrand disease.
Clotting factors, also called coagulation factors, are proteins in the blood that work with small cells, called platelets, to form blood clots. Any problem that affects the function or number of clotting factors or platelets can lead to a bleeding disorder. A bleeding disorder can be inherited, meaning that you are born with the disorder, or it can be acquired, meaning it develops during your life. Signs and symptoms can include easy bruising, heavy menstrual periods, and nosebleeds that happen often. Your doctor will review your symptoms, risk factors, medical history, and blood test results to diagnose a bleeding disorder.
Your doctor may recommend medicines or clotting factor replacement therapy to treat the bleeding disorder. Some bleeding disorders are lifelong conditions, and some can lead to complications. Even if you do not need medicine to treat the bleeding disorder, your doctor may recommend taking precautions before a medical procedure or during a pregnancy to prevent bleeding problems in the future. Explore this Health Topic to learn more about bleeding disorders, our role in research and clinical trials to improve health, and where to find more information.

Causes

Your genes, or other causes such as medical conditions or medicines, can cause bleeding disorders. Sometimes a cause may not be known. Any problem that affects the function or number of clotting factors or platelets can lead to a bleeding disorder. [19,20]

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IV. CONCLUSION

Blood is a type of connective tissue is a complex of mixture of cells Chemicals and fluid blood Transports substances throughout the body and helps to maintain a stable internal environment the blood includes Red blood cells white blood cells platelets and plasma there are about 1 billion blood cells in two or three drops Of blood for every 600 red blood cells there are 40 platelets in one white cell. Blood is also referred as fluid of Growth because it carries nutritive substances from the digestive system and hormones from endocrine gland to All the tissues and it all is also referred as fluid of health because it protects the body against diseases and gets Rid of the waste product . Blood monitoring is quite necessary to reduce the risk of diseases.

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