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**Primary immunodeficiency disorders:**

1. **Common Variable Immune Deficiency (CVID):** CVID is a genetic disorder that affects the immune system. People with this condition have low levels of antibodies (proteins that fight infections) in their blood. When the body does not have enough of these antibodies, people may experience frequent infections. In people with CVID, infections often develop in the respiratory system, ears and sinuses. CVID can increase your risk of developing digestive problems and cancer.

**Etiology :** A genetic mutation (change) causes CVID. In most cases, this genetic mutation and CVID symptoms develop without any apparent cause. In about 10 percent of cases, CVID is hereditary (passed down among family members). CVID results from defects in the genes involved with the immune system. These defects cause the body to produce abnormally low amounts of a proteins called immunoglobulins, including immunoglobulin G (IgG). Low levels of IgG in the blood can make it difficult for the body to fight infections.

1. **Wiscott-Aldrich syndrome:** Wiskott-Aldrich syndrome (WAS) is unique among primary immunodeficiency diseases because, in addition to being susceptible to infections, patients have problems with abnormal bleeding. The bleeding problems are the result of unusually small, dysfunctional platelets (blood cells that play an important role in the formation of blood clots). For patients with WAS, this leads to unique health challenges that are not typically seen in other immunodeficiency disorders. WAS is typically characterized by three basic clinical features:

* Increased tendency to bleed caused by a significantly reduced number of platelets
* Recurrent bacterial, viral and fungal infections
* Eczema of the skin

**Etiology:** caused by a mutation, or error, in the child’s genes

1. **Chronic granulomatous disease:** is an inherited primary immunodeficiency disease (PIDD) which increases the body’s susceptibility to infections caused by certain bacteria and fungi. Granulomas are masses of immune cells that form at sites of infection or inflammation.People with CGD are unable to fight off common germs and get very sick from infections that would be mild in healthy people. This is because the presence of CGD makes it difficult for cells called neutrophils to produce hydrogen peroxide. The immune system requires hydrogen peroxide to fight specific kinds of bacteria and fungi.

These severe infections can include skin or bone infections and abscesses in internal organs (such as the lungs, liver or brain).

**Etiology:** is an inherited disorder caused by mutations in any one of the five components of the nicotinamide adenine dinucleotide phosphate (NADPH) oxidase in phagocytes. This enzyme generates superoxide and is essential for intracellular killing of pathogens by phagocytes.

1. **Agammaglobulinemia:**  or hypogammaglobulinemia, is a group of inherited immune deficiencies in which a person has very low levels of protective immune system proteins called immunoglobulins. Immunoglobulins are a type of antibody. Low levels of these antibodies make you more likely to get infections. it is characterized by a low concentration of antibodies in the blood due to the lack of particular lymphocytes in the blood and lymph it is basically the lack of gamma globulin in the blood plasma, causing immune deficiency.

**Etiology:** mainly affects males. It is caused by a gene defect that blocks the growth of normal, mature immune cells called B lymphocytes. As a result, the body makes very little (if any) immunoglobulins. Immunoglobulins play a major role in the immune response, which protects against illness and infection.

People with this disorder develop infections again and again. Common infections include ones that are due to bacteria such as Haemophilus influenzae, pneumococci (Streptococcus pneumoniae), and staphylococci. Common sites of infection include:

Gastrointestinal tract

Joints

Lungs

Skin

Upper respiratory tract

1. **DiGeorge syndrome:** is a condition present from birth that can cause a range of lifelong problems, including heart defects and learning difficulties. The severity of the condition varies. Some children can be severely ill and very occasionally may die from it, but many others may grow up without realizing they have it.

**Etiology:** DiGeorge syndrome is caused by a problem with a person's genes, called 22q11 deletion. It is not usually passed on to a child by their parents, but it is in a few cases. It's often diagnosed soon after birth with a blood test to check for the genetic fault.

**Secondary immunodeficiency disorders:**

1. **Leukemia:** is a cancer of the blood or bone marrow. Bone marrow produces blood cells. Leukemia can develop due to a problem with blood cell production. It usually affects the leukocytes, or white blood cells. Acute leukemia develops quickly and worsens rapidly, but chronic leukemia gets worse over time.

**Etiology:** Leukemia develops when the DNA of developing blood cells, mainly white cells, incurs damage. This causes the blood cells to grow and divide uncontrollably.

Healthy blood cells die, and new cells replace them. These develop in the bone marrow.The abnormal blood cells do not die at a natural point in their life cycle. Instead, they build up and occupy more space.

As the bone marrow produces more cancer cells, they begin to overcrowd the blood, preventing the healthy white blood cells from growing and functioning normally.Eventually, the cancerous cells outnumber healthy cells in the blood.

1. **Multiple myeloma:** also known as Kahler’s disease, is a type of blood cancer. A type of white blood cell called a plasma cell makes antibodies that fight infections in your body. When you have multiple myeloma, these cells multiply the wrong way. They let too much protein (called immunoglobulin) into your bones and blood. It builds up throughout your body and damages your organs. The plasma cells crowd out regular blood cells in your bones. They also send out chemicals that trigger other cells to eat away at your bones. The weak areas that this creates in your bones are called lytic lesions.

As multiple myeloma gets worse, the plasma cells spill out of your bone marrow and spread. This causes more organ damage.

**Etiology:**  The cause of multiple myeloma is unknown. Though there are no known risk factors for multiple myeloma, researchers suggest that genetic abnormalities, such as c-Myc genes or environmental exposures, may play a role. infections.