AKINOLA TITILAYO FATIMAH

17/MHS02/017

NSC 306

ASSIGNMENT

1. The 5 primary immunodeficiency disorders are:
   * Autoimmune lymphoproliferative syndrome (ALPS)
   * Chronic granulomatous disease (CGD)
   * Common variable immunodeficiency (CVID)
   * Congenital neutropenia syndromes
   * Hyper-immunoglobulin M (hyper-IgM) syndromes
     + **Autoimmune lymphoproliferative syndrome (ALPS)**:it is an inherited disorder in which the body cannot properly regulate the number of immune system cells (lymphocytes). ALPS is characterized by the production of an abnormally large number of lymphocytes. Accumulation of excess lymphocytes results in enlargement of the lymph nodes (lymphadenopathy), the liver (hepatomegaly), and the spleen (splenomegaly) and it causes numerous autoimmune problems including low levels of red blood cells, platelets and neutrophils. ALPS can have varying patterns of signs and symptoms. Most commonly, lymphoproliferation becomes apparent during childhood. Autoimmune disorders typically develop several years later, most frequently as a combination of haemolytic anaemia and thrombocytopenia, also called Evans syndrome. People with this classic form of ALPS generally have a near-normal lifespan, but have a greatly increased risk of developing cancer of the immune system cells (lymphoma) compared with the general population. Mutations in the FAS gene cause ALPS in approximately 75% of affected individuals; these mutations are associated with the classic form of the disorder.
     + **Chronic granulomatous disease (CGD)**: it 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. It may be caused by mutations in one of five different genes. Phagocytes are unable to kill certain bacteria and fungi resulting in increased susceptibility to infections. These severe infections can include skin or bone infections and abscesses in internal organs (such as the lungs, liver or brain). Children with CGD are often healthy at birth, but develop severe infections in infancy or early childhood. The most common form of CGD is genetically inherited in an X-linked manner, meaning it only affects boys. There are also autosomal recessive forms of CGD that affect both sexes.
     + **Common variable immunodeficiency (CVID):** it is an antibody deficiency that leaves the immune system unable to defend against bacteria and viruses, resulting in recurrent and often severe infections primarily affecting the ears, sinuses, and respiratory tract (sinopulmonary infections). In the majority of cases, the diagnosis is not made until the third to fourth decade of life. Permanent damage to the respiratory tract (bronchiectasis) may occur due to severe and repeated infections. CVID can be associated with autoimmune disorders that affect other blood cells causing low numbers of white cells or platelets, anaemia, arthritis and other conditions such as endocrine disorders. Gastrointestinal problems including chronic diarrhea, weight loss, nausea, vomiting and abdominal pain can also be present. In some forms of CVID, patients develop granulomas in the lungs, lymph nodes, liver, skin or other organs. It is caused by a variety of genetic abnormalities resulting in defective ability of immune cells to produce normal amounts of antibodies, resulting in frequent bacterial or viral infections of the upper airways, sinuses and lungs.
     + **Congenital neutropenia syndromes**: they are a group of rare disorders present from birth that are characterized by low levels of neutrophils, a type of white blood cell necessary for fighting infections. NIAID supports basic scientific research on the nature and development of neutrophils, which may lead to insights for addressing congenital neutropenia syndromes. People with congenital neutropenia experience bacterial infections early in life. These may cause inflammation of the umbilical cord stump, abscesses (or boils) on the skin, oral infections and pneumonia. Congenital neutropenia also increases one’s risk for developing myelodysplastic syndromes (MDS), blood disorders that are distinguished by low levels of various blood cells. MDS may progress to a type of blood-cell cancer called acute myeloid leukaemia.
     + **Hyper-immunoglobulin M (hyper-IgM) syndromes**: they include a heterogeneous group of conditions characterized by defective class-switch recombination (CSR), resulting in normal or increased levels of serum IgM associated with deficiency of immunoglobulin G (IgG), immunoglobulin A (IgA), and immunoglobulin E (IgE) and poor antibody function. Hyper-IgM syndrome includes several genetically determined diseases but may also be secondary to congenital rubella syndrome, use of phenytoin, T cell leukaemia, or lymphomas. Infants usually develop severe respiratory infections.
2. The secondary immunodeficiency disorders are:
   * AIDS
   * Metabolic diseases: diabetes mellitus and uraemia
     + **AIDS**: Acquired immunodeficiency syndrome (AIDS) is a chronic, potentially life-threatening condition caused by the human immunodeficiency virus (HIV). By damaging the immune system, HIV interferes with the body's ability to fight infection and disease. HIV is a sexually transmitted infection (STI). It can also be spread by contact with infected blood or from mother to child during pregnancy, childbirth or breast-feeding. Without medication, it may take years before HIV weakens the immune system to the point that have AIDS. There's no cure for HIV/AIDS, but medications can dramatically slow the progression of the disease. These drugs have reduced AIDS deaths in many developed nations. When AIDS occurs, the immune system has been severely damaged. The person will be more likely to develop opportunistic infections or opportunistic cancers-diseases that wouldn't usually cause illness in a person with a healthy immune system.
     + **Metabolic diseases; diabetes mellitus and uraemia:** Two common metabolic disorders with deleterious effect on immunity are diabetes mellitus and uraemia resulting from kidney or liver disease. The control of the metabolic abnormality usually leads to improved immune function. Defective immune functions described in diabetes mellitus include defective phagocytosis and cell chemotaxis, delayed hypersensitivity skin test demonstrating anergy, and poor lymphoproliferative response to mitogens. Impaired glucose metabolism, insufficient blood supply, and denervation are other factors that contribute to explain the increased susceptibility to infections in patients with diabetes. Patients with uraemia present with a 6-fold to 16-fold increased incidence of tuberculosis compared with nonuremic controls. The need for dialysis procedures and use of vascular devices are independent risk factors for invasive infections. In addition to an elevated chronic state of immunologic activation, uremic patients consistently show defective phagocyte chemotaxis and microbicidal activity.