Epstein-Barr Virus

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Overview of Disease:

- Epstein-Barr virus also known as human herpesvirus 4, is a member of the herpes virus family
- Infection that stays with you throughout your lifetime
- EBV is a common human virus worldwide affecting over 90% of adults by the age of 20 in developed countries and 90% of children by age 2 in underdeveloped countries.
- Epstein-Barr goes unnoticed in many individuals, while others show mild symptoms.
- Once contracted EBV lays dormant inside an individual for the rest of their life and in rare circumstances EBV reactivates.
    - Reactivation is known as Chronic Active Epstein-Barr and individuals exhibit prolonged symptoms which usually worsen over time.

Symptoms & Diagnosis:

Symptoms

- Fever
- Fatigued
- Headache
- Sore throat
- Swollen lymph nodes
- Swollen tonsils
- Enlarged spleen
- Skin rash
- Normally lasts 2 - 4 weeks can last longer if an individual is immunocompromised

Diagnosis

- Most accurately diagnosed through blood tests since the symptoms shown by Epstein Barr are comparable to other illnesses
- Blood tests used to detect the antibodies for Epstein Barr include:

~ viral capsid antigen (VCA)

- Anti-VCA IgM appears early in EBV infection and peaks within 2 to 4 weeks after initially infected. After 4 weeks Anti-VCA IgM declines but persists in an individual for the rest of their life.

~ early antigen (EA)

- Anti-EA IgG appears in the beginning phases of the illness, However, after 3-6 months the levels fall to undetectable levels. If Anti-EA IgM antibodies appear years after infection, it is a sign that an individual may have the Chronic Active Epstein Barr Virus.

~ EBV nuclear antigen (EBNA)

- doctors use an immunofluorescent test to test for antibodies to EBNA. Unlike VCA and EA antibodies for EBNA appears two to four months after initial infection. However EBNA persists within a person for the rest of their lives

What the test shows:

- **“Susceptibility to infection**
  People are considered susceptible to EBV infection if they do not have antibodies to the VCA.
- **Primary (new or recent) infection**
  People are considered to have a primary EBV infection if they have anti-VCA IgM but do not have antibody to EBNA. Other results that strongly suggest a primary infection are a high or rising level of anti-VCA IgG and no antibody to EBNA after at least four weeks of illness.
- **Past infection**
  The presence of antibodies to both VCA and EBNA suggests past infection (from several months to years earlier). Since over 90% of adults have been infected with EBV, most adults will show antibodies to EBV from infection years earlier. High or elevated antibody levels may be present for years and are not diagnostic of recent infection” (CDC).

Issues caused by Epstein-Barr Virus:

Affects on the Nervous System:

- Viral meningitis (swelling of tissues the cover the brain and spinal cord)
- Encephalitis (swelling of the brain)
- Optic neuritis (swelling of the eye nerve)
- Transverse myelitis (swelling of the spinal cord)
- Facial nerve palsies (paralysis of facial muscles)
- Guillain Barr Syndrome (an immune system disease)
- Acute cerebellar ataxia (sudden uncoordinated muscle movement)
- Hemiplegia (paralysis on one side of the body)
- Sleeping disorders
- Psychoses

Cancers:

- Burkitt's lymphoma (cancer of the lymphatic system)
- Nasopharyngeal carcinoma (cancer of the upper throat
- Hodgkin's disease and non-Hodgkin's lymphoma (cancers of the lymphatic system)
- Post-transplant lymphoproliferative disorder (white blood cells are produced in excess)

Affects on the Hematology System:

- Affect blood and bone marrow
- Produces an excess number of white blood cells called lymphocytes
- Neutropenia with secondary infections
- Hemophagocytic syndrome (hemophagocytic lymph histiocytosis)
- Acquired hypogammaglobulinemia
- X-linked lymphoproliferative disease

Infections:

- Pneumonia (injury of the lungs)
- Interstitial lung disease (a large group of disorders, most of which cause scarring of lung tissue)
- Pancreatitis (swelling of the pancreas)
- Myocarditis (swelling of the heart muscle)
- Oral cavity-oral hairy leukoplakia (raised, white patches on the tongue), which is usually seen in people infected with HIV

Treatment:

Since there is no antibiotics that can treat the virus, individuals can ease symptoms by:

- Getting plenty of rest
- Drinking a lot of water and other liquids to stay hydrated
- Sucking on ice pops or gargle with warm salt water (soothes sore throat)
- Taking painkillers like acetaminophen or ibuprofen to bring down fever and relieve body aches

Transmission & Prevention

Transmission

Transmitted through bodily fluids:

- Saliva
  - Toothbrush
  - Drinking Glass
  - Baby Toys Kissing
- Blood
  - Transfusions
  - Organ Transplant
- Semen
  - Sexual Intercourse

Prevention

Since there is no vaccine for Epstein Barr, take precautions such as:

- Avoiding any methods of transmission with individuals who have mono
- Avoid sharing of items such as glasses, silverware and toothbrushes
- Avoid kissing or sexual intercourse with someone infected with mono

Chronic Active Epstein-Barr Virus:

Diagnosis & Treatment

- **Diagnosis:**

If the patient has high amounts of EBV DNA in their blood following 3 months after initial infection, they could have Chronic Active Epstein Barr. The quantitate PCR test is used by doctors to measure the amount of EBV DNA in a patient's system

Since antibiotics will not treat the disease doctors treat the symptoms present:

- Hematopoietic stem cell transplantation (experimental trial)(high success rate)
- Naturopathic / Holistic approach is where individuals can adjust their diet by eliminating foods that react to Epstein Barr Virus and eating foods that help with combating the disease such as :
  - Wild Blueberries
  - Celery Juice
  - Sprouts
  - Asparagus
  - Spinach
  - Cilantro
  - Parsley
  - Garlic
  - Ginger
  - Raspberries

Symptoms

- Fever
- Swollen lymph nodes
- Enlarged liver (hepatomegaly)
- Enlarged spleen (splenomegaly)
- Anemia
- Nerve damage
- Liver failure
- Interstitial pneumonia

* Overtime symptoms may get worse

Work Cited Page:

- https://www.cdc.gov/epstein-barr/laboratory-testing.html
- https://www.healthline.com/health/epstein-barr-virus#cancer