

Epstein - Barr Virus (EBV): A Closer Look at a Hidden Epidemic

Background:

- M.A Epstein and T.M Barr first discovered the Epstein - Barr virus in the year 1964.
- According to Gundersen and Lutheran, the definition of the virus is, “A common human virus that causes infectious mononucleosis (“mono”) and plays a role in the emergence of two rare forms of cancer: Burkitt's lymphoma, and nasopharyngeal carcinoma.” The virus has also been reportedly linked to a cause of Hodgkin’s disease (Gundersen and Lutheran, 2006)
- The Epstein - Barr virus is a member of the herpes virus family. This means that following the initial infection the infection initiates a latent state in the person carrying the virus, which can reactivate at any time throughout the carrier’s life (CDC, 2006).
- When it comes to terms of susceptibility, the CDC states that, “If antibodies to the viral capsid antigen are not detected, the patient is susceptible to EBV infection”(CDC, 2006).
- It is transmitted through the exchange of saliva between two individuals. Any form or activity that involves the sharing of saliva spreads the virus. Young children are at risk; adolescents are in danger.
- According to the CDC, “Symptoms of infectious mononucleosis are fever, sore throat, and swollen lymph glands. Sometimes, a swollen spleen or liver involvement may develop. Heart problems or involvement of the central nervous system occurs only rarely, and infectious mononucleosis is almost never fatal. There are no known associations between active EBV infection and problems during pregnancy, such as miscarriages or birth

defects. Although the symptoms of infectious mononucleosis usually resolve in 1 or 2 months, EBV remains dormant or latent in a few cells in the throat and blood for the rest of the person's life. Periodically, the virus can reactivate and is commonly found in the saliva of infected persons. This reactivation usually occurs without symptoms of illness” (CDC, 2006).

- In order to be diagnosed for the virus a doctor can begin to catch on from the lingering symptoms. Once the doctor feels you may be at risk they may test you by using: Serologic tests, “mono spot” tests, or an elevated white blood cell count.
- It is very hard to prevent the spread of EBV. There are no prevention methods suggested, because many healthy people can carry the virus.
- There are no treatment methods available for the virus. The only treatment available is for the symptoms. No antiviral or vaccines are available. Some doctors provide a steroid that reduces the swelling of the lymph nodes, and the tonsils. Others will suggest drinking lots of fluids and plenty of rest.
- The background and nature of the virus has it dubbed, “The Kissing Disease” (CDC, 2006).
- Once infected with infectious mononucleosis, the likeability of one contracting it again is highly unlikely (Gundersen and Lutheran, 2006).

Statement of the Problem:

- Young children who come into contact with the Epstein - Barr virus are less susceptible to be infected by infectious mononucleosis. On the other hand, if the EBV has infected an adolescent, his/her chances of being infected by “mono” increase by as much as 75%. The incubation period after being infected by infectious mononucleosis is 4 to 6 weeks (CDC, 2006).
- Most people carry the Epstein - Barr virus. Usually there immune system keeps the virus in check, but sometimes (rarely) the immune system cannot hold off the virus and it can turn into cancer (Rockefeller, 2006).

- Some organizations believe there is an answer that lies in victims of EBV that, unfortunately, get cancer. The Rockefeller University Hospital has looked at the epidemic in a different light from which they have stated, “The challenge is to understand the role of the virus in the development in the hope that research will provide alternative means to prevent or treat the tumors” (Rockefeller, 2006). This gives hope to a field dedicated to finding a cure and a hope for the unfortunate victims.
- An increasingly large amount of victims that contract EBV associated cancers have immune deficiencies.
- A major problem with this virus is, nobody knows about it. According to Genetic News, they describe the virus with comparisons to sleeping beauty, “Like Sleeping Beauty, the Epstein Barr Virus (EBV) slumbers in the cells of 90% of the world's population, waiting to be awakened - but it's no beauty.” (Medical News, 2006)
- In order to prevent the disease the best way possible one should: eat healthy, watch younger children and clean off (with hot water) whatever objects they may put near their mouths, also know the person who your kissing (you don't know where they've been).

Epidemiologic Picture:

- “The virus occurs worldwide, and most people become infected with EBV sometime during their lives.” (CDC, 2006)
- The virus is exceptionally popular in the United States. According to the CDC, “... as many as 95% of adults between 35 and 40 years of age have been infected with the Epstein - Barr virus.” (CDC, 2006)
- According to the Australian Academy of Science, “People infected with the Epstein-Barr virus will retain it for life, but it may not make them sick. In fact, the virus infects almost everyone in developing countries and more than 80 % of people in developed countries” (Science, 2006).
- It has been proven that most of the victims of the virus are infected at a young age in their childhood/adolescence. Once infected the victim (if

living in a developed country), has a 10-20% chance of contacting it, and then has a 50% chance of contracting glandular fever (CDC, 2006).

- When one gets tested one should be aware of the possibility of an error. A CDC astounding study stated, “False-positive results may be found in a small number of patients, and false-negative results may be obtained in 10% to 15% of patients, primarily in children younger than 10 years of age. True outbreaks of infectious mononucleosis are extremely rare. A substantial number of pseudo-outbreaks have been linked to laboratory error.” This should be considered when contemplating the likeability of contracting the disease.

Solutions:

- **Rockefeller University Hospital**
[\(<http://www.rucares.org/clinicalstudies/protocol.php>\)](http://www.rucares.org/clinicalstudies/protocol.php)

The Rockefeller University Hospital is devoted to clinical studies that will eventually, “Identify the differences in virus specific immune responses between healthy virus carriers and patients suffering from cancer caused by the virus” (Rockefeller, 2006). They have set up a study that pays \$100 to patients with or without the virus despite age or sex as long as you fit the desired profile. The ideal purpose is to see what strengthens the immune system and to see what fights off the cancerous cells. Once they identify the strength then they could use the newly found data against cancerous cells caused by the virus. The procedure is, “Isolating cells from the blood, which is part of the immune control against the Epstein Barr virus” (Rockefeller, 2006). Once this is done, they will compare it to the other samples non-cancer vs. cancer and they will evaluate it. The benefits are simple. The healthy individuals will not gain anything from this program other than feeling the gratification of making a difference in legitimate cancer research. The study takes up to one year, and any participants could be very beneficial to this groundbreaking research. If you or anyone would be interested, please contact Kara Bickham, M.D. Rockefeller University 1230 York Avenue New York, NY 10021, or by telephone: 212-327-8110.

- **Yale University Medical Center**
(<http://info.med.yale.edu/ycc/research/virology.html>)

The Yale Medical Center has eighteen laboratories dedicated to their Molecular Virology Research Program. The mission statement of this program explains that, “The major emphasis of the program involves biochemical and molecular genetic studies of viral regulation and viral interactions with cellular components, including the products of oncogenes and tumor suppresser genes.” It goes on to state that, “The long-term goal of the Program is to establish the fundamental principles of viral carcinogenesis and growth so that this information can be incorporated into successful prevention and treatment strategies for human cancers” (Yale, 2006). Yale is one of the most prestigious universities on the face of the earth. If Yale accomplishes its goal they will, “Understand the basic mechanisms underlying the virus structure, replication, latency and pathogenesis that are ultimately necessary to design rational methods to control the disease. In addition, if history is any guide, basic studies on the host response to viral infection and viral gene expression and function are likely to provide new insights into mechanisms of cell growth control and other areas relevant to the problem of cancer” (Yale, 2006). Contact Daniel C. DiMaio, M.D., Ph.D., Program Director (203) 785-2684, if you have any interest in their program.

- **National Center for Infectious Disease**
(<http://www.cdc.gov/ncidod/emergplan/index.htm>)

The National Center for Infectious Disease is fully dedicated to serving the 21st century and the individuals that live in communities. Their job is to research and strategize how each infectious disease should be handled thoroughly; whether it is through treatments, medication, or quarantine. Their mission statement describes their dedication very clearly, it states, “CDC's vision for the 21st century is of individuals, communities, and nations joined in a common effort to control today's emerging infectious diseases and to prevent those of tomorrow. To realize this vision, CDC scientists have designed a plan to respond to the emergence and resurgence of microbial threats in the new millennium”

(CDC, 2006). For the new millennium and years to come the CDC, is set up for our environmental protection. It is one of the most advanced medical programs in the United States, and it looks to inform/protect people from every disease from the Epstein Barr virus to Aids. For information on their services, please contact: Office of Health Communication, National Center for Infectious Diseases, Centers for Disease Control and Prevention, Mailstop C-14, 1600 Clifton Road, Atlanta, GA 30333.

Internet Resources:

- <http://www.rucare.org/clinicalstudies/protocol.php> - The Rockefeller University Hospital
- <http://www.medicalnewstoday.com/medicalnews.php?newsid=37971> - Medical News Today
- <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1186974> - Pub Med Central
- <http://www.science.org.au/nova> - Australian Academy of Science
- <http://www.gundluth.org/web/chinfo.nsf/AI/P00638> - Gundersen and Lutheran
- <http://cchs-dl.slis.ua.edu/clinical/infectious/byorganism/viral/epstein.htm> - The University of Alabama Digital Health Service Library

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