DOWNLOAD PDF THE EPSTEIN-BARR VIRUS

Chapter 1 : Epstein-barr | Mononucleosis | About Virus | Mono | CDC

Epstein-Barr is the virus that causes mononucleosis. You might know this disease better by its nickname, "mono." It's also called the "kissing disease" because of one way you can spread it to.

Mature infectious particles, which are composed of a kb, double-stranded deoxyribonucleic acid DNA genome, capsid, protein tegument, and lipid-containing outer envelope, are to nm in diameter. The viral capsid is icosahedral and composed of capsomeres. As other herpes virus, EBV is fragile and easily inactivated or degraded. What is the best treatment? For acute uncomplicated infectious mononucleosis IM management consists of supportive care, including rest, fluids, and antipyretics. Acetaminophen and saline gargles usually control the discomfort caused by enlarged lymph nodes and pharyngitis. Several double-blind, controlled studies of corticosteroids for the treatment of IM have shown either no or only modest short-term benefit. Their use should be considered only for the treatment of severe cases characterized by obstruction of airway or thrombocytopenic purpura. Antiviral agents, such as aciclovir, famciclovir, penciclovir, ganciclovir, and other nucleoside analogues, act on the lytic phase of EBV replication. Ganciclovir can inhibit EBV-induced B-lymphocyte immortalization; its antiviral effect after drug withdrawal is more prolonged than that of aciclovir. There is in vitro activity of the above mentioned drugs; however, there is no clinical benefit when administered to patients with uncomplicated IM. That is, the virus is susceptible in vitro but resistant in vivo. How do patients contract this infection, and how do I prevent spread to other patients? Epidemiology Most reports have indicated no seasonal predilection. Patients from lower socioeconomic groups are at higher risk of acquiring the infection early in life. In these groups of patients, intrafamiliar propagation is frequent. Endemic infectious mononucleosis is frequent in college students living in close contact, such as those living in dorms and frequenting other educational facilities. It is an ubiquitous infection. The age at initial primary infection varies in different cultural and socioeconomic settings. In higher socioeconomic groups and industrialized countries the infection takes place later in life. A higher rate of infection has been noted in white persons than in other ethnic groups, and a modest increase of infection in males than in females. Primary infections during pregnancy, but not reinfection have been associated with fetal involvement. Transmission via breast milk is unclear. There is scarce evidence of EBV transmission and IM illness with sexual intercourse and closely related behaviors. EBV has been detected in genital ulcers, the uterine cervix, and the male reproductive tract. These findings raise the potential for venereal transmission. There is no clear evidence of an increasing rate of infection over the last decade. Infection control issues EBV is shed regularly in saliva, and, therefore, infection control policies are difficult to develop. In addition, mechanisms for its transmission are not clearly understood. For the hospitalized patient, standard precautions are recommended. Transmission can also occur through blood products and organ transplantation; thus, persons with a recent EBV infection or IM like-illness are urged to refrain from donating blood or organs. A safe and efficacious vaccine is not available, although efforts continue on its development. Because of concern over the administration of a vaccine with unknown long-term effects, including malignancy, most vaccine development attempts have focused on development of subunit EBV vaccines. These types of vaccines have shown to be immunogenic and well tolerated; recipients were not protected from EBV infection; however, symptoms of IM were reduced. An effective vaccine is needed for persons at high risk for development of EBV-associated lymphoproliferative diseases LPD and cancer, such as patients with acquired immunodeficiency syndrome AIDS , those with X-linked LPD, and organ transplant recipients. Adults and children at high risk for developing post-transplant LPD e. What host factors protect against this infection? EBV is a herpetic lymphotropic microorganism; latently infected B-cells are its primary reservoir in the body, although monocytes may also play a role in its latency. After this T-cell response, the number of EBV infected cells drops significantly during the next 4 to 6 weeks. The histopathology will vary according to the clinical syndrome or disease caused by EBV. Most cases of acute IM are benign, and the diagnosis is based on clinical and serologic findings, thus, histopathology examination of tissues is rarely required. There is information on tissues, such as lymph nodes, tonsils, and spleen, from patients with unusual disease that requires surgery.

Most histopathologic changes due to EBV infection have been attained from patients with LPD and other serious complications. The lymph nodes show active lymphoid follicles with lymphoid proliferation of the sinuses, blood vessels, trabecula, and capsule this latter one usually remains intact. The response is mediated mainly by T and B immunoblasts with a pleomorphic pattern and mitosis indicative of rapid cell turnover. Small and large atypical lymphocytes can be seen, as well as plasma cells, eosinophils, histiocytes, and micronecrosis. The tonsils also contain an active lymphoproliferative response with more prominent follicles and extensive necrosis. The spleen is enlarged two to three times its normal size and weight during the acute stage of the infection because of hyperplasia of the red pulp. As in lymph nodes, the cells are primarily immunoblasts with pleomorphism; subcapsular hemorrhage is commonly encountered. The liver shows minimal disease with infiltration by lymphocytes and monocytes in the portal area and minor degeneration of the hepatocytes. The bone marrow can appear normal during acute IM; however, there have been reports of hypercellularity and small granulomas. The central nervous system CNS shows, when involved, lymphocytic infiltration of the meninges. Less commonly, there can be demyelinization, degenerative changes, focal hemorrhages, congestion, and edema. Its most common form is Burkitt lymphoma BL , which has uniform layers of small noncleaved cells. In EBV-related LPD syndromes and B-cell lymphomas collectively named post-transplantation lymphoproliferative disorder [PTLD] , the histologic findings range from benign lymphoid hyperplasia with normal tissue architecture and a pleomorphic response polyclonality to well defined malignant lymphomas. There are diffuse inflammatory cell infiltrates; some of the neoplastic cells have classically been termed Red-Sternberg cells and mononuclear Hodgkin cells collectively termed as H-RS cells. These cells are large, and their multinucleated pattern is evidence derived from germinal centers of B-cells. Their nucleoli are strongly stained and surrounded by a clear area resembling a halo. The classic HD includes four categories: The sclerosing variety is most commonly found in children with HD. Epithelial tumors of the nasopharynx: In children, the most common type of epithelial cells is the undifferentiated variety characterized by undifferentiated squamous cells with multiple copies of monoclonal EBV DNA. Other EBV virus-associated diseases: Tissues of patients with hemophagocytic lymphohistiocytosis HLH , such as bone marrow, spleen, lymph nodes, brain, and skin can be affected. The bone marrow shows hypocellularity, mainly activated macrophages with engulfment of all bone marrow elements, their precursors, or fragments, including erythrocytes, platelets, and leukocytes. Tissues of patients usually adults with AIDS with this disorder show keratin or parakeratin projections, acanthosis, ballooning, hyperparakeratosis, and hyperplasia of the prickle cell layer. Mild inflammatory cell infiltrates in the connective tissue can be seen. What are the clinical manifestations of infection with this organism? It is the most common illness associated with infection by EBV. Clinical manifestations The incubation period is approximately 4 to 6 weeks, whether acquired through contact with infected secretions or after a blood transfusion. The prodrome lasts 3 to 5 days and is that of mild headache, malaise, and fatigue. Younger children are more likely to be afebrile. Generalized lymphadenopathy is a hallmark of IM; any group of lymph nodes can be involved; however, those of the anterior and posterior cervical chains are the most frequent. They are tender, firm, usually single, 2 to 4cm in diameter, and not matted. Massive mediastinal and hilar lymph nodes can cause respiratory distress. Mesenteric lymphadenopathy can mimic acute appendicitis. Lymph node enlargement tends to subside over a period of days to weeks. Pharyngitis characterized by sore throat is the cardinal symptom of IM. Pharyngitis caused by EBV is clinically indistinguishable of that caused by group A streptococci. Rarely, spontaneous or trauma-induced rupture of the spleen can lead to hemorrhage, shock, and death. Once splenomegaly is detected, repeated splenic examination should be avoided. The triad of lympadenomegaly, splenomegaly, and exudative pharyngitis in a febrile patient is typical but not pathognomonic of IM caused by EBV. Hepatitis can occur with anorexia and vomiting. The rash involves mainly the trunk and arms and rarely palmar and solar regions. It appears during the first few days of illness and lasts 1 to 6 days. It can be erythematous, macular, papular, or morbilliform. Sometimes, it can be urticarial or scarlatiniform or acrocyanotic. Rarely, it is petechial, vesicular, umbilicated, or hemorrhagic. Rashes resembling those of Gianotti-Crosti syndrome and secondary syphilis have been described. An increased incidence and severity of rash can occur in patients with EBV IM who are prescribed beta-lactam antibiotics, mainly ampicillin or amoxicillin. It is copper-colored,

appears mainly in the trunk, and it can develop into an extensive, confluent, maculopapular pruritic eruption that extends to palms and soles. It can persist for up to 1 week, with desquamation taking place over several more days. Rash does not represent hypersensitivity to beta-lactams. Similar rashes have been described in EBV infected individuals following the use of azithromycin and cefprozil. Pulmonary manifestations A small percentage of the patients can develop paroxysmal cough and radiographic findings of patchy alveolar and interstitial pneumonia. Nervous system manifestations Neurologic disorders can occur in association with clinical findings typical of IM. Cardiac manifestations Electrocardiographic and echocardiographic abnormalities, as well as pericarditis and myocarditis, have been reported. Hematologic manifestations Occasionally, patients develop transient thrombocytopenic purpura. Other rare complications are hemolytic anemia, aplastic anemia, agranulocytosis, and agammaglobulinemia.

Chapter 2 : Epstein-Barr virus linked to seven serious diseases

Epstein-Barr virus (EBV), also known as human herpesvirus 4, is a member of the herpes virus family. It is one of the most common human viruses. EBV is found all over the world. Most people get infected with EBV at some point in their lives. EBV spreads most commonly through bodily fluids, primarily.

This article has been cited by other articles in PMC. Past EBV infection is associated with lymphomas, and may also result in certain allergic and autoimmune diseases. Although potential mechanisms of autoimmune diseases have not been clearly elucidated, both genetic and environmental factors, such as infectious agents, are considered to be responsible for their development. In addition, EBV modifies the host immune response. The worldwide prevalence of autoimmune diseases shows how common this pathogen is. Normally, the virus stays in the body and remains dormant throughout life. However, this is not always the case, and a serious EBV-related illness may develop later in life. This explains the chronic course of autoimmune diseases that is often accompanied by exacerbations of symptoms. The EBV has also been reported in patients with autoimmune thyroid disorders. Although EBV is not the only agent responsible for the development of autoimmune thyroid diseases, it can be considered a contributory factor. Human beings are the primary reservoir for EBV. Its main targets are B-lymphocytes and nasopharyngeal epithelial cells. Most infections are symptomless [2]. Past EBV infection is associated with Burkitt lymphoma, Hodgkin disease, and nasopharyngeal or stomach cancer [1]. In addition, there is a hypothesis that past EBV infection can also lead to certain allergic and autoimmune diseases [1]. Viral load remains relatively constant over time in circulating B-cells with a non-activated phenotype [4]. However, during the latent phase, EBV reactivation is possible. It can be caused by either immunosuppression, certain cytokines, or steroid hormones [1]. Infectious agents and autoimmunity Although potential mechanisms of autoimmune diseases have not been clearly elucidated, both genetic and environmental factors, such as infectious agents, are considered to be responsible for their development [5]. The microbial agents include viruses, bacteria, fungi, and parasites [6]. Also, five possible mechanisms for the pathogenesis of autoimmune diseases have been distinguished: The role of the Epstein-Barr virus in autoimmunisation Epstein-Barr virus is considered to be an aetiological factor of autoimmune diseases because of the following: Epstein-Barr virus shows immunomodulatory effects. The Epstein-Barr virus can also infect T lymphocytes [12]. This was the reason to suspect that the EBV might participate in the development of autoimmune diseases [13]. Several mechanisms of autoimmunity have been shown to be involved in the pathogenesis of these diseases. As far as lupus erythematosus is concerned, these are: For rheumatoid arthritis, they include: Patients with infectious mononucleosis have been reported with various antibodies in their serum. This can also suggest that there is a link between the EBV infection and autoimmune diseases [23]. Aetiology of autoimmune thyroid disorders Autoimmune thyroid disorders AITDs are the most common organ-specific autoimmune diseases [24]. Autoimmune thyroid disorders develop upon activation of specific helper T cells directed against the thyroid antigens, the thyroid peroxidase TPO , and the thyrotropin receptor TSHR. Activated helper T cells induce B cells to secrete thyroid antibodies, such as the thyroid peroxidase antibodies TPOAbs and the thyrotropin receptor antibodies TRAbs [26]. Family clustering of these disorders may provide evidence for their genetic and environmental aetiology [27]. Other factors that are also considered to be responsible for autoimmune thyroid disorders include: This confirms an infectious aetiology of the disorders [31]. Penhale and Young have demonstrated that rats that have undergone both thymectomy and irradiation are less susceptible to AITDs if maintained under specific pathogen-free conditions [33]. As a result, the chickens became hypothyroid [34]. Based on these results, infections may either induce or exacerbate autoimmune thyroid disorders [27]. In a study by Wasserman, it was shown that prior infection with Toxoplasma gondii can be closely associated with elevated thyroid peroxidase antibodies [36]. Other studies have found that there is a possible link between HIV infection and autoimmune thyroid disorders [40 , 41]. Serological data indicates that the influenza virus, hepatitis C virus, enterobacteriaceae, streptococci, staphylococci, Yersinia, and Helicobacter can have an influence on AITDs as well [26 , 42]. Nevertheless, conflicting data has also been published with regard to the rubella virus, the

parvovirus, as well as hepatitis B and C viruses [43]. Epstein-Barr virus as an aetiological factor in autoimmune thyroid disorders In one study, thyroid tissue specimens obtained from AITD patients and patients with multinodular goitre have been investigated to detect Herpesviridae DNA. However, there was no statistical significance observed in AITD patients, nor in patients with any other viruses [44]. There is a hypothesis that in genetically susceptible patients, EBV-infected autoreactive B-cells seed the thyroid gland, produce autoantibodies, and send co-stimulatory signals to autoreactive T-cells [45]. In their study, Akahori et al. Moreover, Nagata has also reported increased TRAb titres in children with infectious mononucleosis due to EBV primary infection [23]. The seroprevalence of EBV infection was reported to be higher in children with autoimmune thyroid disorders when compared to the controls [50]. It is said that thyroid autoantibodies occur more frequently in subjects with autoimmune diseases versus the general population [24]. The EBV can lead to in vitro transformation of normal resting B lymphocytes to proliferating lymphoblasts [12]. However, it can be considered a contributory factor. Further investigations still need to be undertaken to explain the link between the EBV infection and autoimmune thyroid disorders. The authors declare no conflict of interest. Bocian J, Januszkiewicz-Lewandowska D. Ocular involvement in Epstein-Barr virus infection. Postepy Hig Med Dosw Online ; Biology and disease associations of Epstein-Barr virus. A novel form of Epstein-Barr virus latency in normal B cells in vivo. Toussirot E, Roudier J. Epstein-Barr virus in autoimmune diseases. Best Pract Res Clin Rheumatol. Epstein-Barr virus and cytomegalovirus in autoimmune diseases: Ann N Y Acad Sci. Mechanisms for the induction of autoimmunity by infectious agents. Lotz M, Roudier J. Epstein-Barr virus and rheumatoid arthritis: Viral interleukin in chronic active Epstein-Barr virus infection. Tomer Y, Davies TF. Infection, thyroid disease, and autoimmunity. Raised antibody titres to E. An increased prevalence of Epstein-Barr virus infection in young patients suggests a possible etiology for systemic lupus erythematosus. Epstein-Barr virus and multiple sclerosis. From evidence to therapeutic strategies. Systematic review and meta-analysis of the sero-epidemiological association between Epstein-Barr virus and rheumatoid arthritis. Epstein-Barr virus as a trigger for autoimmune hepatitis in susceptible individuals. Epstein-Barr virus induces normal B cell responses but defective suppressor T cell responses in patients with systemic lupus erythematosus. Pathophysiological links between rheumatoid arthritis and the Epstein-Barr virus: Production of thyrotropin receptor antibodies in acute phase of infectious mononucleosis due to Epstein-Barr virus primary infection: Prevalence of anti-thyroid antibodies and thyroid dysfunction in selected rheumatic diseases. The role of Epstein-Barr virus infection in the development of autoimmune thyroid diseases. Infections and autoimmune thyroid diseases: Infection and autoimmune thyroid disease. J Clin Endocrinol Metab. The relative importance of genetic and environmental effects for the early stages of thyroid autoimmunity: Clin Endocrinol Oxf ; Serological evidence of thyroid autoimmunity among schoolchildren in two different socioeconomic environments. Thyrocytes express a functional toll-like receptor 3: The influence of the normal microbial flora on the susceptibility of rats to experimental autoimmune thyroiditis. Rapid induction of hypothyroidism by an avian leukosis virus. Infection and thyroid autoimmunity: A seroepidemiologic study of TPOaAb. Zandman-Goddard G, Shoenfeld Y. A retrospective analysis of diseases associated with indeterminate HIV western blot patterns. Int Arch Allergy Immunol. Desailloud R, Hober D. Detection of herpes virus DNA in post-operative thyroid tissue specimens of patients with autoimmune thyroid disease. Exp Clin Endocrinol Diabetes. Cellular responses to viral infection in humans:

Chapter 3 : Reactivated Epstein Barr Virus â€“ What You Need to Know

The Epstein-Barr virus causes mononucleosis in the majority of cases. This ubiquitous, highly contagious organism is a member of the Herpesviridae family of viruses (other viruses in this family include herpes simplex, varicella-zoster, cytomegalovirus, and human herpes virus 6 & 7).

We are learning more and more, what often sets off the immune system response in the first place can be a variety of infections, including EBV. This is important because autoimmunity is on the rise and we need a better understanding of its underlying causes. So, what can be done to treat Epstein-Barr? Actually, the best way to tackle Epstein-Barr is similar to how we deal with an imbalance of gut microbes â€" manipulate the environment so balance is restored. The most important thing I find is to support the natural immunity and decrease exposures to environmental toxins and other infections. So, in order to treat EBV the approach needs to focus on getting the virus back in check, not killing it. This means manipulating the condition of your body â€" the environment where the Epstein-Barr virus lives. When I discover a patient of mine has Epstein-Barr virus, here are the things I consider: Clean diet and proper nutrition â€" This reduces inflammation and immune system burden. We eliminate gluten, dairy, allergens, and start a plant-based Paleo diet. Sugar is one of the most powerful immunosuppressives so that must be eliminated at all costs. Heal the gut â€" Healing the gut is a priority for anyone dealing with EBV. Toxins can leak through damaged gastrointestinal lining and cause the immune system to overreact. This process is also known as endotoxemia, driven by LPS. Eliminate any infections â€" Check for any coexisting infections and work to treat these. It is critical also to decrease total toxic load by eliminating any toxic exposures. Optimize detox pathways â€" This includes supporting the liver, kidneys, and colon and may be supported by various nutritional supplements and other homeopathic drainage remedies. Improving sleep habits â€" This is essential because so many repairing and detoxification processes occur during the deepest stages of sleep. I advise no less than 8 hours per night or as much sleep as required to wake up refreshed without an alarm clock. Reduce stress â€" Stress is a major cause of immune system dysfunction, it could even be what awakened your EBV in the first place. You must work to reduce stress â€" your health depends on it. Try prayer, meditation or spending time in nature. Self care must be a priority. Herbal supplements â€" Herbs such as Ashwagandha, licorice, St. Other more extreme therapies have have been tried in a few cases, with some success and include: Antiviral medication, Acyclovir or valcyclovir Immune cell therapy when used in a person after a transplant. Bone marrow transplant is an extreme therapy that has been documented in two life threatening cases. Cord blood stem cell transplants. This is a new but emerging treatment that may be very successful in tough cases. In general, the follow treatments only temporarily stop symptoms and only in some people: Antiviral therapy such as ganciclovir and vidarabine. Immunosuppressive agents such as cyclosporine and corticosteroids. Immunomodulatory therapy such as interferon alpha and interferon gamma. Cytotoxic chemotherapy such as anthracyclines, etoposide, cyclophosphamide, vincristine, and prednisone. Infusions of cytotoxic T and lymphokine-activated lymphocytes. The Epstein-Barr virus is a significant condition I wish more people knew about â€" Share this article to spread awareness of this sleeping giant.

Chapter 4 : A possible link between the Epstein-Barr virus infection and autoimmune thyroid disorders

The Epstein-Barr virus (EBV) is a member of the herpes virus family (human herpesvirus 4). EBV is found worldwide and is a common cause of viral pharyngitis, especially in young adults. EBV is found worldwide and is a common cause of viral pharyngitis, especially in young adults.

Swollen glands in the neck Weakness and sore muscles As the Epstein barr virus symptoms are shared with other illnesses, consequently you might need to consult a doctor when the symptoms appear. Is Epstein barr contagious? The virus is found in saliva, as a result you can catch mono from kissing someone who is infected. There are other possible ways to catch EBV Using the toothbrush from an infected person Sharing the same glasses, spoons, â€¦ Getting it from sex, as it is found in semen Blood transfusion Organ transplant The Epstein barr is contagious even when you are not sick. EBV stays in your system rather long after you got over mono. Reactivated Epstein barr virus is unlikely. Once a person went through a EBV outbreak, the body gets finally immune for the disease. Recurring outbreaks of the virus are unusual. EBV can lead to other illnesses The Epstein barr virus infection is the trigger for glandular fever infectious mononucleosis. But there are other diseases that can rather be caused by Epstein Barr. Ear infections and diarrhea in children Guillain-Barre syndrome What is glandular fever The initial EBV infection triggers glandular fever and is caused by the so called "Pfeifferian glandular fever". The Pfeifferian glandular fever is typically manifested by swollen lymph nodes, fever, dysphagia, headache, and limb pain. To learn more about glandular fever symptoms, checkout our herpes symptoms page for more information. Is there a Epstein barr virus cure As for all other herpes types, the common knowledge is that there is no cure for the EBV virus and it will go after some time. We think you should shorten the recovery time by the use of our technology. It is furthermore correct that the body will fight the Epstein barr, but why should you suffer for too long? With our technology you can achieve fast pain relief and effective recovery. Glandular fever and the initiating EBV virus can be treated using the here on this website available method. By the use of activated quantum frequencies , we boost your immune system and allow the effective healing process. How to treat Epstein barr virus naturally using Herpes-No. Many customers struggled a chronic Epstein barr infection for to long and lost almost their life quality. Our advice is to use our Epstein barr virus natural treatment that runs over a period of two month. On a daily base, we activate the treatment twice for a duration of 10 minutes each to kick start and stabilize your immune system. You will as a result experience fast pain relief and in addition lasting results on glandular fever mono. You will be convinced by the result and motivated to take our recommended Epstein barr virus cure over two month for lasting results. Free yourself now from the epstein barr virus rush and end pain in 24 to 48 hours. Activate your Epstein barr cure in less than 5 minutes!

Chapter 5 : Epstein-Barr Virus

Among the many next-tier suspects is the Epstein-Barr virus (EBV). EBV belongs to the family of herpes viruses including those that cause cold sores, genital herpes, chickenpox and shingles.

Share on Pinterest Connected, but at what level? Mononucleosis is also a possible by-product of EBV. In addition, EBV is a member of the herpes family of viruses. The Centers for Disease Control and Prevention CDC says EBV was first identified in as one of the most common human viruses in the world, infecting 90 percent of the population at some point in their lives. Many people do not experience illness or only have mild symptoms. EBV is best known as the major cause of infectious mononucleosis. Most people are infected with EBV early in childhood and produce no symptoms. But those who are not infected during childhood may have a tendency to get mononucleosis at a later time in life. Mononucleosis is an infectious condition that can arise from EBV. This activation has been found to be associated with multiple sclerosis. We have all practically been exposed to this virus EBV. Only a fraction got mono. But that fraction of folks has a higher risk for MS. There is a tendency for MS patients to have a higher level of immune reactivity to the illness. Bebo discussed how this is a chicken and egg thing. Or was the virus reactivated and caused the inflammation that causes the damage of MS? When his son was diagnosed, Embry did what he knew best. The study suggests that meticulous and thorough examination be made, or this low level of EBV could be missed, skewing data. The study also suggests that EBV may infect more than one cell type in MS, including microglia and astrocytes, creating a more dynamic relationship between the two. More research is suggested to verify these findings and to find the possible link between the presence of EBV, neuroinflammation, and neurodegeneration. MS is not the only disease showing a connection to EBV. It is also associated with nearly , annual cases of cancer. Caroline Craven is a patient expert living with MS. Her award-winning blog is GirlwithMS. Written by Caroline Craven on March 10, related stories.

Chapter 6 : Epstein Barr Virus - Causes, Risks and NEW Cure for Fast Pain Relief!

Most people are infected by the Epstein-Barr virus (EBV) in early childhood. It usually causes no symptoms or only a brief, mild illness. When teens or young adults become infected, it can cause infectious mononucleosis, or "mono.".

Chronic fatigue syndrome, fibromyalgia, and even Lyme disease are other possibilities you might have entertained, especially if you have symptoms beyond those mentioned above. But then you came across something called reactivated Epstein-Barr virus, which fits your symptoms to a tee. And beyond that, what makes chronic reactivated EBV chronic â€" and how does it play into other chronic illnesses? To find out, read on to learn more about this complex and convoluted microbe called Epstein-Barr virus and what can make it a long-term troublemaker. Yep, you read that right: EBV is a close relative of genital herpes. Herpesviruses are composed of strands of DNA inside an envelope. After initial infection, they stay dormant in tissues indefinitely, but can reactivate if immune system functions become depressed. The virus spreads primarily by oral route via saliva. To enter the body, it infects mucous membranes lining the mouth, throat, and stomach. From there, the virus infects B cells, the type of white blood cell that produces antibodies. It also infects T cells and natural killer cells , but to a lesser extent. Infected white blood cells transport EBV throughout the body. In this active phase, called the lytic phase, the virus takes over the machinery of infected cells to generate new viruses. This is when people are most symptomatic and contagious. The virus spreads remarkably easily, especially in children. Following that, infected children rapidly pass it along to other children. Known as kissing disease, infectious mononucleosis IM is spread by intimate contact with someone shedding the virus. It usually catches the person off guard when immune system functions are depressed, such as during the stress of high school or college. Common symptoms include sore throat, fever, severe fatigue, and swollen lymph nodes. It can drag on for months and be quite debilitating. The virus, however, is not eradicated. Memory B cells infected with EBV accumulate in lymphoid tissue and nerve tissue, and stay there for a lifetime. This dormant state is referred to as the latent phase. In fact, recent evidence supports that people often actively shed virus from tonsillar tissues without having significant symptoms. You can carry it for a whole lifetime and not know it â€" as most people do. Symptoms of reactivated EBV include severe chronic fatigue, chronic achiness, chronic sore throat and irritation of mucous membranes, swollen lymph nodes, and a range of debilitating neurological symptoms. Symptoms can wax and wane for years. Severe cases can include evidence of liver dysfunction, immune suppression, and anemia. This is where things get both interesting and complicated. People often carry other herpesviruses in addition to EBV. Though they are all related, each of these viruses infects the body in a different way â€" therefore they cause slightly different symptom profiles. In important ways, they are all remarkably common: They stay dormant in tissues and can be reactivated just like EBV. Many people with chronic Lyme disease , fibromyalgia , and chronic fatigue syndrome are found to have reactivation of EBV, along with other herpesviruses and a list of other microbes including Mycoplasma, Bartonella, Chlamydia, and new microbes added to the list every day. Many studies have defined a variety of different mechanisms by which the virus could initiate and perpetuate MS â€" not enough to define EBV as the sole cause of MS, but highly suggestive that it does play a role in the illness. They have the ability to live inside cells. They infect white blood cells and are carried throughout the body, especially to areas of inflammation. They can persist in a dormant state. They are master manipulators of the immune system. They can exist in healthy people without causing illness. They are present in all populations of the world. The deeper you dig, the more connections you find between chronic illnesses and stealth microbes. Let immune system functions falter, however, and like a pot boiling over on the stove, the microbes erupt and cause illness. Chronic Immune Dysfunction Is Triggered by the Perfect Storm I came to see chronic illness differently than most other physicians because of my personal struggle overcoming chronic Lyme disease. My experience taught me that the microbes are always there â€" I had likely harbored mine since childhood. For me, that perfect storm was caused primarily by years of chronic sleep deprivation associated with every-other-night obstetrics on-call-duty and eating a poor diet on the run, but there were other minor stress factors as well. My recovery did not progress until I started addressing the underlying chronic immune dysfunction. As I shifted

my practice toward caring for individuals with chronic illness, I began to see similar patterns in my patients â€" not necessarily the same stress factors that I had experienced, but stress factors that disrupt immune functions just the same. I began cataloging them and, interestingly, I reached a limit of just five categories of stress factors that are associated with chronic illness. As astounding as it may sound, I came to the conclusion that the causes of all chronic illnesses can be traced back to these five factors that I came to call System Disruptors. The 5 System Disruptors are: We live in a world saturated with artificially manipulated foods. Regular consumption of these foods disrupts all systems of the body. The modern world is saturated with artificial toxins such that normal background radiation from the sun, solar system, and the earth itself are now amplified. Toxins disrupt all healing systems of the body. Continually running from the proverbial tiger inhibits digestion, suppresses immune function, disrupts sleep, and sets the stage for chronic illness. Cumulative trauma, excessive heat or cold causes damage to the body, but living a sedentary life can be just as harmful. The effects from this system disruptor set the stage for chronic illness. What type of chronic illness they ended up with depends on three factors: Testing for IM looks for antibodies to the virus; the presence of different types of antibodies can distinguish between IM and reactivated EBV. If you have all the symptoms of chronic reactivated EBV, then the likelihood of EBV being present is quite high, along with other microbes. As for treating chronic reactivated EBV, because there are antiviral agents that work well for IM, you might expect that chronic EBV would also respond to antivirals. Scientists have sorted out the technical reason for this. Antiviral agents work by blocking DNA polymerase, an enzyme the virus uses to replicate inside cells. Latent or chronic EBV infection, however, does not require DNA polymerase for the virus to replicate â€" therefore, current antiviral agents are ineffective against chronic EBV infection. Lots of researchers are also looking at vaccines against EBV. The problem is that characteristics of the virus vary greatly across different geographical areas, making it difficult to create a single vaccine. B-cell depletion with monoclonal antibodies targeting EBV-infected B cells with immunoglobulins and new types of antiviral drugs. The underlying problem is chronic immune dysfunction, and you will not start getting well until normal immune system functions are restored. First and foremost is minimizing the five System Disruptors. Following an optimal diet and making some lifestyle modifications to promote a healing environment in the body is essential for overcoming chronic EBV or any other chronic illness. Modern herbal therapy should be the cornerstone of any restorative approach. Herbal extracts have incredible abilities, including: Reducing destructive inflammation Enhancing natural killer cells and other aspects of the immune system necessary to control microbes like EBV Balancing hormone systems in the body that have been disrupted by chronic illness Suppressing stealth microbes directly to restore balance in the microbiome While many herbs have been found to suppress EBV, EBV is rarely found in isolation â€" chronic immune dysfunction always allows a variety of low-grade stealth pathogens to flourish. Therefore, a comprehensive regimen of herbal extracts is necessary. Some effective herbal extracts for restoring immune function, balancing the microbiome, and suppressing viruses such as EBV include:

Chapter 7 : The Sleeping Giant â€“ Tips to Treat Reactivation of Epstein-Barr Virus - Jill Carnahan, MD

Epstein Barr Virus Information Including Symptoms, Diagnosis, Treatment, Causes, Videos, Forums, and local community support. Find answers to health issues you can.

Combined, these seven diseases affect nearly 8 million people in the U. Study results published April 12 in the journal Nature Genetics. The project was led by three scientists: The study shows that a protein produced by the Epstein-Barr virus, called EBNA2, binds to multiple locations along the human genome that are associated with these seven diseases. Overall, the study sheds new light on how environmental factors, such as viral or bacterial infections, poor diet, pollution or other hazardous exposures, can interact with the human genetic blueprint and have disease-influencing consequences. Here are some of the initial implications: In the US and other developed nations, more than 90 percent of the population becomes infected by age In less-developed nations, 90 percent of people become infected by age 2. Once infected, the virus remains in people for their entire lives. Mononucleosis, which causes weeks of extreme fatigue, is the most common illness caused by EBV. Mono was nicknamed the "kissing disease" years ago because the virus spreads primarily via contact with saliva. Over the years, scientists have linked EBV to a few other rare conditions, including certain cancers of the lymphatic system. Harley, who has devoted much of his career to studying lupus, found possible connections between lupus and EBV years ago. That work includes proposing mechanisms that the immune system uses in response to the virus that lead to lupus, and showing that children with lupus almost always are infected with EBV. I think this study might well encourage them to push forward faster and with rededicated effort. However, when EBV infections occur, something unusual happens. The EBV virus invades the B cells themselves, re-programs them, and takes over control of their functions. Our bodies have about 1, known transcription factors at work within our genome. Each cell uses a subset of these to become what they are and to respond to their environment. These proteins constantly move along the strands of our DNA, turning specific genes on and off to make sure cells function as expected. The new paper shows that seven seemingly unrelated disease states actually share a common set of abnormal transcription factors, each affected by the EBNA2 protein from the Epstein-Barr virus. When these EBNA2-related clusters of transcription factors attach themselves to one portion of the genetic code, the risk of lupus appears to rise. When those same transcription factors land on another part of the code, the risk of multiple sclerosis appears to rise. More genomic analyses involving many more patients with these diseases will be required to make reliable estimates. We do not have a sense of the proportion in which the virus could be important in the other EBNA2-associated diseases. So if we could develop therapies to stop them from doing this, then it would help multiple diseases. They applied the same analytic techniques to tease out connections between all 1, known transcription factors and the known gene variants associated with more than diseases. Intriguing associations were documented involving 94 conditions. This one is more important than all of the rest put together. It is a capstone to a career in medical research," he says. Software behind discoveries to be made public Detecting and tracking the activities of these transcription factors took years of work involving dozens of laboratory and computational experts. The project required gathering massive sets of genetic data, then analyzing every genetic change affecting the activity of the virus. Both software tools and a related website will be made publicly available.

Chapter 8 : Epsteinâ€“Barr virus - Wikipedia

Epstein-Barr virus snoRNA1 is a box CD-snoRNA generated by the virus during latency. V-snoRNA1 may act as a miRNA-like precursor that is processed into 24 nucleotide sized RNA fragments that target the 3'UTR of viral DNA polymerase mRNA.

Sweat Dizziness Keep in mind that while these are some of the most commonly seen Epstein-Barr virus symptoms, some people experience symptoms not as commonly associated with Epstein-Barr which can easily lead to misdiagnoses which can ultimately make it difficult to feel better and get to the source of the problem if not working with an experienced health professional. How Do You Contract the Virus? So, we now know some of the symptoms of Epstein Barr, and we know that it is much more complicated than many medical professionals may know, but how exactly does someone develop Epstein-Barr? One of the very first ways someone can contract the virus is if a mother had Epstein-Barr while pregnant, her baby could get it. Secondly, you can get the virus through blood transfusions infected with the virus, but you can also get it by just coming in contact with someone who is infected with this virus if they are in the infected stage. It all depends on the stage the virus is at within the body which is what I am going to review next. There are four stages to the virus. If you let your body become too depleted the virus could become opportunistic and strike at this time. The virus may also take advantage during periods where your body may be going through some hormonal changes such as during pregnancy or for teenagers, during puberty. The thing about stage one of the Epstein-Barr virus is that you can contract the virus, but it can hang around and wait for the perfect moment to strike for a long time, sometimes years. Stage Two Stage two is when the virus has decided to strike and can turn into mono as we spoke about before. At this stage, symptoms will vary from person to person. Some people may go through this stage with only a mild sore throat and just some fatigue while others may experience more severe symptoms such as debilitating fatigue and a severe sore throat. Some people may even develop a rash. The length of time someone will experience these symptoms also varies. Some may only be down and out with the virus for about a week while others may be battling the symptoms for months. Stage two is also the time where the virus may be targeting one or more than one of your organs to hang out in. Often times the EPV Epstein-Barr virus will choose the liver or the spleen as these two organs are home to certain toxins that the virus loves. Stage Three During stage three, things are a little bit different. The virus may have chosen its organ or organs of choice to call home, and if you were to get blood work, then lab tests may show antibodies which doctors would mark as having a past EBV infection. This is where the problem comes in. If your doctor is reading your lab work as if the virus is no longer active but you have not taken any steps to ridding your body of the EBV then the virus could very well be active in the body and still causing issues. The virus can go undetected as being active during this stage because chances are it is hiding out in one or more than one of your body organs. We will talk specifically about this and thyroid health coming up. When the Epstein-Barr virus lives in one of your organs, it can cause inflammation, and it can do so without triggering your immune system since the virus is literally hiding. After stage two, your immune system may stop attacking the virus thinking that it has already ridden the body of the infection when in reality, EBV is just a very smart and tricky virus that knows how to hide in the body and not be detected. Stage Four In the final stage of the Epstein-Barr virus, its end goal is to affect your nervous system. If the virus invades your thyroid during stage three, there is a good chance you may begin to experience some unwanted symptoms such as nerve pain and just feeling achy throughout your body. Unfortunately, during this stage blood work would not necessarily detect any sign of the infection so it can be very difficult to be diagnosed properly if you are not working with a health professional who has experience with this condition and its various stages. Once it attacks your nervous system, you could experience things like ongoing fatigue, insomnia, and numbness in your extremities. It is during this stage that many people are misdiagnosed, and many people are given inappropriate medications or are thought to have hormonal imbalances because lab tests are not able to pick up on the infection. How is the Epstein-Barr Virus Diagnosed? Often times, this virus is diagnosed during stage two of the virus when symptoms are at their worst. Many people will head to the doctor complaining of a sore

throat and fatigue, and their doctor will run blood work. It is not as simple as one would think, with four stages and the ability for the virus to hide out in your body for long periods of time you have to work with someone who knows the virus well to give you the proper diagnosis. The Connection Between the Epstein-Barr Virus and Thyroid Health We have talked about how the Epstein-Barr virus can affect different areas of the body, but I want to talk specifically about its effect on thyroid health. The connection between the Epstein-Barr virus and thyroid health occurs during stage three of the virus. If you remember, stage three is when the virus has decided which organ or organs it wants to call home, but it can also leave its organ of choice and begin attacking other organs or even your thyroid when your immune system is out of control dealing with the virus. Now, remember when I said that the Epstein-Barr virus is incredibly smart? This can make it very difficult for your immune system to number one, find the virus that may be hiding out in your thyroid, and number two go after it. This virus specifically goes after the thyroid as a way to disrupt the endocrine system as a way to get closer to affecting the nervous system which generally occurs in stage four of the virus. As awful as this virus sounds, there are things that you can do to support your body and keep the virus at bay if it is something you have been infected with which is what I am going to talk about next. If you suspect this is something affecting you, you can contact me here for an initial consultation to talk about an individualized approach to getting to the bottom of your health concerns. On top of working with a skilled Functional Medicine Practitioner, there are other steps you can take to support your body. I gained 30 pounds out of nowhere and had a severe case of brain fog. I also started to get severe anxiety and panic attacks. All I wanted was to get my life backâ€¦ Finally, I learned about functional medicine and found a practitioner that I hoped could help me. They ran specialized tests that were far different than I had ever had before. When I got the results back, it turned out I had candida, parasites, high cortisol, the Epstein Bar Virus and many food intolerances. I also had an issue with my thyroid that no one found before because they were using the conventional medicine lab ranges which are way too broadâ€¦. I went through treatment of all of these things and it completely changed my life. I immediately lost the 30 pounds I had gained plus more, I had a lot more energy, and my brain fog was gone. I felt amazing and knew that I wanted to help people find the underlying causes of their symptoms and disease. If you are not ready to make an appointment but would like more information?

Chapter 9 : Epstein-Barr Virus: A Key Player in Chronic Illness | RawlsMD

The study shows that a protein produced by the Epstein-Barr virus, called EBNA2, binds to multiple locations along the human genome that are associated with these seven diseases.

In this case, it is unlikely that the person has Epstein-Barr virus or mononucleosis. When the test is done too soon after infection, there may not be enough antibodies in the blood to trigger a positive result. If the test results are normal, a person may still contract the Epstein-Barr virus at some point in the future. These antibodies give doctors information about when the virus occurred: If the antibody to EBNA is present, this means the virus was contracted at least 6 to 8 weeks previously, but possibly longer, as this antibody takes some time to develop after infection and remains in the body for life. Treatment It is important to stay hydrated when treating symptoms of the Epstein-Barr virus. There are no medical treatments for Epstein-Barr virus or mononucleosis. Get plenty of rest. Avoid strenuous activity until the symptoms resolve. Drink lots of fluids to stay hydrated. Ease sore throats with acetaminophen or ibuprofen. Gargle with salt water several times per day. People with an active case of mononucleosis may feel better more quickly if they reduce their activities until the illness resolves. Doing too much too soon can lead to a relapse or longer recovery time. Heavy lifting or strenuous activities can increase the risk of rupturing the spleen, a rare but life-threatening complication of mononucleosis. Outlook The Epstein-Barr virus affects people differently. Some people, especially children, may not be aware that they have the virus, while others may have symptoms for weeks or months. Usually, symptoms resolve from an active Epstein-Barr infection or mononucleosis after 1 to 2 months. After a person recovers, the virus remains dormant in the body, and an Epstein-Barr virus antibody test will still work. The virus can reactivate at any time but usually will not cause symptoms if it does. In rare cases, the Epstein-Barr virus may remain active and lead to long-lasting symptoms.