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### RESEARCH ARTICLE

#### A STUDY ON THE DETAILED DESCRIPTION OFFIFTH DISEASE& MYSTERY REGARDING THE NON-PHARMACOLOGICAL TREATMENT OFFIFTH DISEASE

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#### Abstract

Fifth disease is a mild rash illness, caused due to parvovirus B19. This will be mainly seen in children compare to adults. Other names for this include: Erythema Infectiosum (EI), Slapped cheek syndrome. Epidemics of erythema infectiosum mainly occurs in late winter or early spring. Tests for this include specific parvovirus B19 IgM antibody. IgM antibodies usually founds within 7 to 10 days of virus exposure, the remain measures are from 2 to 3 months after exposure to virus. Symptoms mainly includes rash, headache, fatigue, low-grade fever. However, there is no vaccine or medicine that prevent parvovirus B19 infection. Adults who have symptoms of joint pain and swelling may need rest, to alter their activities. And take Nonsteroidal anti-inflammatory drugs like Aspirin, Ibuprofen, or Naproxen sodium. Patients who are suffering with chronic parvovirus arthritis occasionally benefit from drugs such as hydroxychloroquine and corticosteroids and also, they want to avoid dairy products, Sweets and sugar. They want to increase their fluid intake and vitamin c supplements to improve their immune system.

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#### Introduction:-

Fifth disease is a mild rash illness, caused due to parvovirus B19.<sup>[1]</sup> This will be mainly seen in children compare to adults. If a person who is infected with fifth disease becomes sick within 14 days. other names for this include: Erythema Infectiosum (EI), Slapped cheek syndrome. It will mainly appear as red rash on the arms, legs, and cheeks.<sup>[2]</sup> This will be more severe in pregnant women or anyone with a compromised immune system. According to The American Osteopathic College of Dermatology (AOCD) it was common and mild contagious to others.<sup>[3]</sup>

#### Epidemiology

According to Worldwide epidemics, Erythema infectiosum mainly occurs in late winter or early spring, with the incidence rate for every 4-7 years. Approximately 60% of adults at age 20 years are seropositive for PVB19, according to schools and households Infection rates vary from 20-50%.<sup>[4,5,6]</sup>

According to Sex, epidemics will be common for both men and women. But compare with the men and women who have some of the complications like Arthropathy and fifth disease in pregnancy.<sup>[7,8]</sup>

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According to Age, related epidemics Approximately 70% of fifth disease cases are more likely seen in children at age of 5-15 years, but the cause is this disease may occur at any age.<sup>[9]</sup>

### History

The Term "Fifth disease" was coined by Leon Chinese who was a Russian -French Physician in 1905, He also proposed a number wise classification of the six most common childhood exanthems.<sup>[10,11,12,13,14]</sup> This virus was firstly described by Werner in 1957 at the University of Pennsylvania, Brachman et al.<sup>[15]</sup>

### Signs and Symptoms

The main symptoms for fifth disease include rash, which may resemble mild symptoms of flu. Some symptoms for this include: Headache, fatigue, low-grade fever, sore throat, nausea, runny nose, stuffy nose. And also, to cheeks. the rash will appear on: Arms, legs and trunk of the body. compared to adults, children are more likely to get a rash. In adults this usually may cause joint pains, which lasts for several weeks.<sup>[16,17,18]</sup>

### Complications

Complications for fifth disease include Transient aplastic crisis, arthropathy,<sup>[19]</sup> chronic red cell aplasia, gloves and socks syndrome, hydrops fetalis. Chronic bone marrow failure. Other morbidities include Viral-associated hemophagies, Rheumatoid arthritis/chronic polyarthritis mimicking rheumatoid arthritis,<sup>[21]</sup> Systemic sclerosis, Systemic lupus erythematosus. Autoimmune diseases like pulmonary disease Idiopathic thrombocytopenic purpura, Diamond-Black fan-like anaemia, Acute vasculitis syndromes, Atypical nonspecific, erythematous exanthema, Myocarditis/pancarditis, Hepatitis - Rarely, elevated liver transaminases or hepatitis may occur alone or with aplastic crisis.<sup>[20,22,23]</sup>

### Diagnosis

Diagnosis for fifth disease is not usually performed by self-limiting progression of disease and also have mild symptoms. Testing can be done via bloodwork, for testing the specific antibodies. This disease can mainly diagnose through specific parvovirus B19 IgM antibody. which confirm the acute infection. This IgM antibodies can be found within 7 to 10 days of virus exposure. These virus exposures can remain for 2 to 3 months.<sup>[24]</sup> and also, IgG antibodies will rise about 2 weeks after viral exposure, and the patient will confer immunity as these can be measurable for life. For transient aplastic crisis or immunocompromised patients with chronic infection, Viral DNA testing is crucially used for the diagnosis of parvovirus B19 infection. But these patients can remain contagious and they did not show positive results for IgM or IgG antibodies.<sup>[25]</sup> Fifth disease can also be diagnosed through Polymerase chain reaction (PCR) assays which was over less sensitive nucleic acid hybridization assays. The sensitivity and specificity test of PCR assays vary widely among laboratories, and but PCR does not show more sensitive than IgM antibody assays in acute parvovirus infection.<sup>[26]</sup>

### Mode of Transmission

Virus is mainly spread through infected respiratory droplets; (blood-borne transmission). The secondary risk is exposed to household persons for about 50% and for classroom contacts is about 50%. Fifth disease is transmitted through respiratory secretions (saliva, mucous etc.), but it can spread through contact with infected blood. The incubation period for fifth disease was usually between 4 and 21 days. Before onset of symptoms Individuals are mostly affected with this disease. Mainly, school children, day-care workers, teachers, and mothers are exposed to this virus. when symptoms are evident, there is some risk of transmission then infected person need not be isolated.<sup>[27,28]</sup> The incubation period is normally between 4-14 days, but can last for 20 days. When symptoms are evident, the risk of transmission is small; therefore, symptomatic individuals need not be isolated separately.<sup>[29,30]</sup>

### Stages and types of fifth disease

The first stage of fifth disease has some symptoms which will be similar to cold or other infections, such as a fever, chills, a sore throat, a headache, and exhaustion. The second stage of fifth disease, where a rash appears on the face, giving the appearance like rosy cheeks, from this appearance virus gets the name as "slapped cheek disease." which usually lasts for a few days. During the third stage, a rash spread to other parts of the body, mainly the arms, legs, and torso. This rash typically appears to have a lacy pattern, and cause itchy. This stage may last up to three weeks, and which may get better and then worsen during that time.<sup>[31]</sup>

### Pathophysiology

Human PV-B19, which is a single-stranded DNA virus and also a member of the family Parvoviridae, it is a heat-stable; <sup>[32]</sup> which is the only parvovirus that cause disease in humans. The development of erythema infectiosum in children is mainly caused by infection PV-B19. Acute infection in a host which is immunocompetent that leads to Th-1-mediated cellular immune response, by the production of specific immunoglobulin M (IgM) antibodies and forms immune complexes. Signs and symptoms of erythema infectiosum are mainly formed by the deposition of the immune complexes in the skin and joints of individuals and but not from the circulating virus. <sup>[33]</sup> The incubation period is usually between 7-10 days, but it can be lasts for 4-21 days. Extremely high viral loads can be noted in patients with aplastic crisis, but low-level persistent polymerase chain reaction shows positivity in tissues which was common in adults in a variety of tissues. <sup>[34,35]</sup>

In fifth disease Arthropathy is most commonly observed in adult women, where fewer like (10%) commonly observed in children. which is mainly a symmetrical polyarthritis, that involves only in finger joints which occurs after the exposure for 2 to 3 weeks.

Aplastic anemia can also be seen with association of human PV-B19 due to the affinity and cytotoxicity of the virus for erythroid progenitor cells. This complication is mainly observed in patients with underlying haemolytic anaemia or immunodeficiency. <sup>[36]</sup> which due to high red blood cell (RBC) production, due to shortened cell life span, during acute infection haematocrit levels decrease up to 10 to 15%. Most of the patients have a human PV-B19 aplastic crisis only once, and but a rash following aplastic crisis is rare.

Fifth disease also develops Bone marrow suppression, reticulocytopenia, but in rare cases, they show mild lymphopenia, neutropenia, and thrombocytopenia. In fifth disease In-utero also exposed Fetal transmission which may result in severe anaemia leads to congestive heart failure and feta hydrops. This may also fewer than 10% of primary maternal infections. according to some Studies about 1 to 9% risk of Fetal death in pregnant women exposed to active human parvovirus infection, with a greater risk of Fetal loss in early pregnancy. <sup>[37]</sup> Approximately one half of women of childbearing age are tested as seropositive; they are immune and but they have no risk to the foetus. Till now there is no evidence for specific congenital malformations due to in-utero exposure to human PV-B19. <sup>[38,39]</sup>

### Causes

Fifth disease is most commonly caused in source of late winter, spring, early summer. It can be spread at any time and of any age. Adults have antibodies which prevent from developing fifth disease because of previous exposure during childhood. In adult, the symptoms can be severe. If you get fifth disease while in pregnancy stage, there are serious risks for unborn baby, like life-threatening anaemia. In children who has healthy immune systems, fifth disease is common. <sup>[40]</sup>

### Prevention

Fifth disease has no vaccine or medicine which prevents parvovirus B19 infection. For prevention of fifth disease frequently wash your hands to decrease the chance of becoming infected which is probably effective. Infected persons with fifth disease who are attending to work or going to school is not likely to prevent the spread of the virus, they develop rash and they are contagious. <sup>[41]</sup>

### Treatment

Generally, no treatment for fifth disease is necessary for healthy children and adults who get it. If the rash itches occur an antihistamine drugs can be used. For those have symptoms like joint pain, especially in adults, anti-inflammatory pain relievers such as ibuprofen can be used. Those who have sickle cell anaemia, chronic anaemia, or an impaired immune system can take immunoglobulin by injection to fight with the virus and some of these patients may also need blood transfusions. <sup>[42]</sup>

### Non-pharmacological treatment

For fifth disease infection, drink plenty of fluids, it helps in detoxification of the system and improves by recovery process. Consume fresh fruit juices or boiled vegetable soup, these foods are loaded with energy helps easily to digest and also help to improve from weakness, fatigue, and muscle pain during the initial phase of the illness. Regular Hand wash regimen is very important hygienic management for this disease condition. In Homeopathic remedies like Bryonia, Arsenic Alb and Natrum Mur be helpful in decrease the symptoms of fever and sore throat with others. Don't apply anything on the rash allow the rash to cure itself by naturally in a couple of weeks. <sup>[43]</sup> More

intake of Vitamin C like lemons, oranges, Indian gooseberry improves the immune system with strength for faster recovery and also has antioxidant and has antiviral properties. apple cider vinegar also helpful for fifth disease because it is in acidic in nature, have an alkaline environment for the body to recover, where some virus also has acidic in nature. A little amount of apple cider vinegar in one glass of warm water and 1 teaspoon of honey, Mix the three and take it firstly in the morning and last thing when you hit the sack which improve the immune system to work faster.

Solanum Trilobatum (climbing brinjal plant) is also used to treat fifth disease which has purple-coloured flowers and red coloured berries and is covered with thorns throughout the body and is commonly used to treat cold and flu. This plant leaves used freshly or can be dried and powdered to be stored for a long time and this powder can also add in soups, omelets or green tea, regularly which gives relief in cough and cold flu, and also relief in chest congestion and blocked nose. Astragalus roots is also used to treat fifth disease which belongs to legume family which is commonly used in traditional Chinese medicine which is said to improve the function of immune system and also has great antiviral properties and also have antibacterial and anti-inflammatory properties have prevent various respiratory conditions which also strengthens the lungs and help fight fifth disease. Baking soda bath also provides great relief from burning and itching sensation that the rashes which appear from the virus.<sup>[44]</sup>

### Conclusion:-

Erythema infectiosum is a parvovirus which mainly appear as mild rash.<sup>[1]</sup> which may spread though dropletssaliva.<sup>[27,28]</sup> There is no specific treatment for fifth disease it is treated for symptoms associated with it.<sup>[41]</sup> Where nonpharmacological therapy is required to treat rashes like keep hygiene, bath with warm water and baking soda and increase fluid intake, vitamin c supplements to increase immune system.<sup>[44]</sup>

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### Conflict of Interest

No conflict of interest.

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