DISEASE PROJECT:
COXＳACKIEVIRUS A16
Hand, Foot, and Mouth Disease (HFMD) is a Coxsackievirus A16 infection and is spread by person-to-person contact. This disease is a common viral illness that often times will affect children under 5 including infants. This is not to say it does not affect adults.
AN ETIOLOGIC AGENT

Fecal-oral contamination is the usually way the infection is spread. Occasionally the virus is spread by

- droplets and expelled by an infected person. Coming into contact with bodily fluids, changing diapers,

- using items like utensils, toys, tables may also transmit the virus.
A HISTORY OF THE ETIOLOGY AGENT

• In 1948-1949 Dr. Gilbert Dalldorf, a scientist working at the New York State Department of Health in Albany, New York discovered the Cosackieviruses. He and Grace Sickles were searching for a cure for poliomyelitis. During his studies isolating feces of polio patients he discovered viruses that would often mimic polio. He would name this virus family Coxsackie, after a small town with the same name in New York where he obtained his first fecal specimens.
Dalldorf found that Coxsackieviruses would cause a variety of infections and he later subdivided the infection into groups A and B based on their pathology. This discovery found evidence that viruses can at times interfere with another’s growth and replication within a host. Further evidence showed that the protein interferon can mediate this growth and replication. This would later become an important treatment of a variety of infectious diseases and cancers.

In 2007, Eastern China experienced an outbreak of coxsackievirus. Approximately 800 people were affected. 22 children died from the virus and 200 children were hospitalized.
A CASE OF THE DISEASE:
THE CHRISTMAS SURPRISE
A CASE OF THE DISEASE: THE CHRISTMAS SURPRISE

During Christmas my wife’s family always gets together and this year was no different. Five different families gathered around a big table to eat and celebrate only this year there was a special surprise. The family had been warned that two of the kids had Hand, Foot, and Mouth Disease (HFMD), and so like a good family we all got together despite these warnings and tried to avoid coming in to contact with the children.
A CASE OF THE DISEASE: THE CHRISTMAS SURPRISE

Roughly 3 days after the Christmas party, I felt a strong fatigue over my body. My joints ached and I began to have fevers. My highest temperature was 102.7F. Within this time my daughter developed an uncontrollable itch to her feet and hands. We tried several different creams and ointments but nothing would help. It was the next day that my wife remembered about the HFMD that was the secret Christmas surprise. My daughter's hands developed small red blisters to her hands, feet, mouth, and a little on her stomach. I then began to develop blisters to my hands, feet, and mouth. In my mouth a sore throat developed as well.
A CASE OF THE DISEASE: THE CHRISTMAS SURPRISE

During this time my family and I decided that we needed to be quarantined so we stayed in our house. I avoiding work, my daughter avoided school and my wife took care of us. My wife reached out to our extended family, all of which denied that my daughter or I could have developed it. On my 5th day of contracting this infection, we went to Urgent Care for a proper diagnosis to which the doctor informed me that I had a perfect case of HFMD. The provider informed us that the symptoms would lasts approximately 7 days from onset and after that time we would still be contagious for another 7 days.
Our blisters never developed more than being sores to our hands, feet, and mouth but they were painful. They felt like pins and needles and every time I closed my hands or would walk, I could feel those needles again. My fever only lasted the first 2 days and the blisters went away after 7 days. The blisters never popped or drained. The small fluid that was present absorbed back into my skin. As for the molecular change that happened in my skin from the blisters, that could be seen as my skin began to peel after 9 days. Little circles all over my hands and feet of dead skin began to peel off. 2 months later after having this infection I am still peeling little circles off my feet.
HFMD falls into a group of viruses called Coxsackieviruses. This positive-sense ssRNA virus belongs to Picornaviridae and the genus Enterovirus. These viruses are some of the most common human pathogens and are further divided into group A and group B viruses based on early observations of their pathogenicity. Group A is the group that HFMD belongs to. This group tends to infect the skin and the mucosa of its host. It has a reproductive number estimated to have an average of 2.50 with an interquartile range of 1.96 to 3.67. They are typically transmitted by the fecal-oral route.
ETIOLOGIC AGENT AND DESCRIPTION OF SPECIFIC VIRULENCE FACTORS

These viruses are non-motile and do not have staining characteristics. In general it is believed that picornviruses do not have a strong virulence but they do have a capsid and how this reacts to the receptors on the host cell will determine the virulence of the phenotype. Picornviruses virulence factor lies in how it affects the coding sequences of different proteins.
PATHOPHYSIOLOGY

The picornavirus genome is 7000-8500 nucleotides long and consists of a single non-segmented strand of RNA strand. Using different cellular receptors the virus' RNA enters the host cell through a membrane channel. Once in the cytoplasm virus replication occurs. The hosts’ transcription processes become muted and the virus’ RNA is prepared into capsids during replication. Picornavirus effects the host during generalized myositis.
HFMD will often present in individuals as a skin rash or sores to the hands, feet and mouth. Fever is also very common during onset. Individuals may acquire the infection by coming into contact with:

- Saliva
- Fluid from blisters
- Stool
- Air droplets (Respiratory, cough, sneeze)
Diagnosis is usually made based on the history and physical exam of the host. Lab tests are available for the virus but they are not usually necessary. Usually symptoms are reasoned by the time of year, the incubation period, the community of the exposure and specific symptoms.
METHODS OF PREVENTION AND TREATMENT

HFMD is spread from person-to-person by contact either horizontal vectors (sneezing, coughing, saliva) or by touching contaminated surfaces. Risks can be lowered by:

• Washing your hands often with soap and water
• Disinfecting dirty surfaces and soiled items
• Avoiding close contact with infected people
• And spreading of the virus can be managed within the host by limiting contact of infected part of the body to another area. Avoid hands touching face, avoiding hands touching feet.
METHODS OF PREVENTION AND TREATMENT

• HFMD infections are commonly associated with a rash and have a short incubation period of 4 to 6 days from the time of exposure to the beginning of symptoms.

• Nonspecific fevers usually develop suddenly and last about 3 days. Complaint of muscle ache, headache, and scratchy throat are common. The entire illness tends to last from 1 to 6 days without any treatment. There are no cures for viruses but symptoms can be managed with an antihistamine or NSAIDs for pain management.
DISEASE IMPORTANCE

This disease has been understood for several years. It is a Coxsackievirus infection that belongs to Picornaviridae and the genus Enterovirus. The infections etiology is understood, its preventative measures are known and the treatment, though it’s limited, is understood as well. The importance of this disease is not the need to find a cure or to stop it. The importance is the understanding of the disease. Knowing that this disease has a sore incubation period, knowing that its exposure time is short, knowing that its duration is 1-6 days allows us to know its virulence, and virulence is what it important in any understanding of a disease.
REFERENCES

  • Facts about virus types, infection causes, treatment, incubation

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