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A REVIEW ON YELLOW FEVER

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ABSTRACT

Yellow fever virus (YFV) is the prototype member of the genus Flavivirus, a group of viruses that are transmitted between vertebrates by arthropod vectors. The virus is found in tropical regions of Africa and South America and is transmitted to primates by mosquitoes: Aedes spp. in Africa and Haemagogus and Sabethes spp. in South America. Despite the availability of an effective vaccine, yellow fever (YF) is considered a reemerging disease owing to its increased incidence in the past 25 years. Molecular epidemiologic data suggest there are seven genotypes of YFV that are geographically separated, and outbreaks of disease are more associated with particular genotypes. In addition, the risk of urban YF, owing to transmission of the virus by Aedesaegypti, is increasing in Africa, as is the potential of urban YF returning to South America. Both present serious potential public health problems to large population centers

Keywords: Yellow fever, sign symptoms, diagnosis.

INTRODUCTION

Yellow fever virus (YFV) was first isolated in West Africa in 1927. It is the proto-type member of the family Flaviviridae and genus Flavivirus, which get their name from the Latin word for yellow (flavus). The genome is a single-stranded, positive-sense RNA, 10,500–11,000 nucleotides in length.(1)(2)

The genus Flavivirus contains approximately70 viruses, and the major flavivirus diseasesare yellow fever (YF), dengue, West Nile, Japanese encephalitis, and tick-borne encephalitis (3). Ecologically the flaviviruses are termed arboviruses owing to most flaviviruses being arthropod-borne; YFV is transmitted between primates by mosquito vectors.

Yellow fever is a mosquito-borne viral illness found in tropical and subtropical areas in south America and Africa.transmission is primerily via aedes and haemagogus species of mosquito. It can present with varying clinical features ranging from a self-limited, mild febrile illness to severe homarrage and liver diease. The “yellow” comes from jaundice that affects some patients with severe diease.(4)

A brief history of yellow fever virus

The first disease outbreak that can reliably be regarded as YF was documented in 1648and occurred in the Yucatan, Mexico (15). A Mayan manuscript described xekik (black vomit), which is a characteristic manifestation of severe YF. The term yellow fever was prob-ably first used by Griffin Hughes in his book Natural History of Barbados (1750). An early description of a disease outbreak in Haiti in1495 was likely YF. Most researchers generally agree that YFV originated in Africa, and shipping routes associated with commerce were most likely responsible for the spread of YFV from Africa and its introduction into the New World. The intensity of the international trade linking Africa, America, and islands in between inevitably resulted in YF epidemics in major cities. Outbreaks occurred as far south as Montevideo, Uruguay, andTocopilla, Chile, and as far north as Quebec, Canada.(5)

Fig. 1: The yellow fever mosquito.

The Aedesaegypti mosquito is the primary vector responsible for the transmission of yellow fever virus (YFV) between humans. Known as the YF mosquito, this vector is responsible for explosive outbreaks of urban yellow fever (YF) in African, South American, and Central American cities. Image from the Public Health Image Library, Centers for Disease Control. Photo, James Gathany; contributor Frank Collins. (Courtesy of the Centers for Disease Control and Prevention; with permission.

Sign and symptoms

Once contracted, the yellow fever virus incubates in the body for 3 to 6 days. Many people do not experience symptoms, but when these do occur, the most common are fever, muscle pain with prominent backache, headache, loss of appetite, and nausea or vomiting. In most cases, symptoms disappear after patients who enter the toxic phase die within 7 - 10 days. aching muscles, particularly the back and knees, a high fever, dizziness, loss of appetite, nausea, shivers, or chills, vomiting, headache.

These symptoms usually disappear within 7 to 10 days. These symptoms usually improve after a few days, but around 15 percent Trusted Source of people enter a second stage, or toxic stage. The symptoms are more severe, and they may be life-threatening.

These include: recurring fever, abdominal pain, vomiting, sometimes with blood, tiredness, sluggishness, lethargy, jaundice, which gives the skin and whites of the eyes a yellow tinge, kidney failure, liver failure, hemorrhage, delirium, seizures, and sometimes coma ,irregular heartbeats, bleeding from the nose, mouth, and eyes(6)

Causes

Yellow fever is caused by a virus carried by mosquitoes. You can develop this disease if you are bitten by a mosquito infected with this virus.This disease is common in South America and in sub-Saharan Africa.Anyone can get yellow fever, but older people have a higher risk of severe infection.If a person is bitten by an infected mosquito, symptoms usually develop 3 to 6 days later.(6)

Etiology

The virus is an RNA virus of the genus Flavivirus, closely related to the viruses that cause West Nile, St. Louis, and Japanese encephalitis. Tree-hole breeding mosquitoes, such as Aedesaegypti and Haemagogous species, transmit yellow fever during the rainy season. The yellow fever virus has three distinct transmission cycles: jungle, intermediate, and urban. The jungle cycle involves transmission between non-human primates (monkeys) and mosquitoes. Humans are infected through infected mosquito bites while visiting or working in the jungle. The intermediate cycle occurs in the African savannah and involves humans who live or work in jungle border areas. Transmission may be between monkeys and humans or humans via mosquito vectors. The urban cycle involves a viremic human who contracted the virus in either the jungle or intermediate cycle who then returns to an urban area. Humans develop significant viremia to infect mosquitoes, which can then transmit the virus to other humans in urban areas. Person to person or primate to human transmission has not been reported without the involvement of a mosquito vector.(7)

Epidemiology

Vaccination has decreased worldwide epidemics of yellow fever, but the infection has reemerged in many parts of Africa and South America. No one is immune from yellow fever, and it occurs in people of all ages and races. The highest mortality rates are reported in infants and the elderly, who often have depressed immune systems. yellow fever is very rare in the United States. Most cases are diagnosed in unvaccinated travelers to sub-Saharan Africa or South America. While most people develop a self-limited infection, those who develop severe disease.(7)

Pathophysiology

The incubation period is 3 to 6 days. Once acquired, the virus quickly spreads to multiple organs in the body. The liver is the most important organ affected by yellow fever. It produces profound jaundice due to liver damage. The kidneys also undergo similar pathological alterations and can lead to acute renal failure. When the upper gastrointestinal (GI) tract is involved, the gastric acid mixed

with blood produces what is known as black vomit. Central nervous system (CNS) features include cerebral edema and hemorrhage. Encephalopathy is also a common feature of yellow fever.(8)

Transmission of Yellow Fever Virus

Yellow fever virus is an RNA virus that belongs to the genus Flavivirus. It is related to West Nile, St. Louis encephalitis, and Japanese encephalitis viruses. Yellow fever virus is transmitted to people primarily through the bite of infected Aedes or Haemagogus species mosquitoes. Mosquitoes acquire the virus by feeding on infected primates (human or non-human) and then can transmit the virus to other primates (human or non-human). People infected with yellow fever virus are infectious to mosquitoes (referred to as being "viremic") shortly before the onset of fever and up to 5 days after onset.

Yellow fever virus has three transmission cycles: jungle (sylvatic), intermediate (savannah), and urban. The jungle (sylvatic) cycle involves transmission of the virus between non-human primates (e.g., monkeys) and mosquito species found in the forest canopy. The virus is transmitted by mosquitoes from monkeys to humans when humans are visiting or working in the jungle.In Africa, an intermediate (savannah) cycle exists that involves transmission of virus from mosquitoes to humans living or working in jungle border areas. In this cycle, the virus can be transmitted from monkey to human or from human to human via mosquitoes. The urban cycle involves trans¬mission of the virus between humans and urban mosquitoes, primarily Aedesaegypti. The virus is usually brought to the urban setting by a viremic human who was infected in the jungle or savannah.

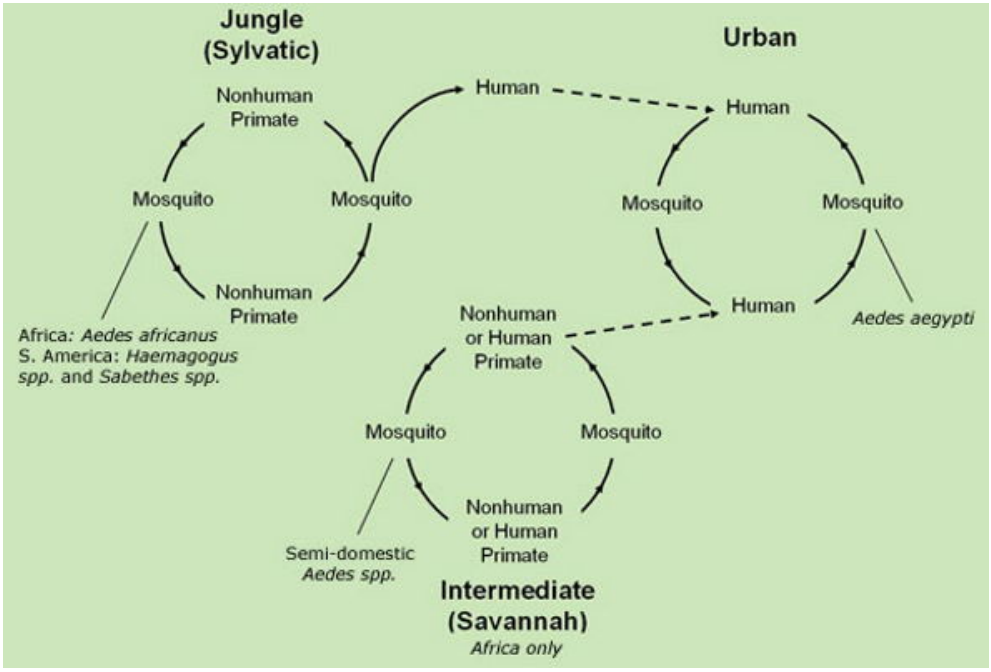

Fig 2: Yellow fever virus has three transmission cycles: jungle (sylvatic), inter¬mediate (savannah), and urban.(9)

Exam and test

The health care provider will perform a physical examination and order blood tests. These blood tests may show liver and kidney failure and evidence of shock. It is important to tell your provider if you have traveled to areas where the disease is known to thrive. Blood tests can confirm the diagnosis.

Possible Complications

Complications that may result include: Coma, Death, Disseminated intravascular coagulation (DIC), Kidney failure, Liver failure, Salivary gland infection (parotitis), Secondary bacterial infections, Shock

Yellow Fever Vaccine

Prevention is based on the use of attenuated live virus vaccine from strain 17D, developed in 1937 by Max Theiler, a virologist who received the Nobel Prize in Medicine in 1951. The vaccine is considered safe (1,255 severe adverse events for 333 milliondoses applied13) and highly effective (immunogenicity between 90% and 98% after day 10). Since 2013, the WHO has reviewed the need to repeat additional doses every 10 years.In immune-compromised populations such as people living with HIV/AIDS, women vaccinated while pregnant and children under 5 years of age, there may be changes in the recommendations in the near future. However, the main contraindication is related to the use of immunosuppressive drugs at the time of vaccination or weeks before receiving the vaccine

Vaccine

YF-VAX®, Yellow Fever Vaccine, for subcutaneous use, is prepared by culturing the 17D-204 strain of yellow fever virus in living avian leukosis virus-free (ALV-free) chicken embryos. The vaccine contains sorbitol and gelatin as a stabilizer, is lyophilized, and is hermetically sealed under nitrogen. No preservative is added. Each vial of vaccine is supplied with a separate vial of sterile diluent, which contains Sodium Chloride Injection USP - without a preservative. YF-VAX is formulated to contain not less than 4.74 log10 plaque forming units (PFU) per 0.5 mL dose throughout the life of the product. Before reconstitution,

YF-VAX is a pinkish color. After reconstitution, YFVAX is a slight pink-brown suspension.The vial stoppers for YF-VAX and diluent are not made with natural rubber latex.

Treatment

No specific treatment exists for yellow fever, which is one reason that preventative measures such as vaccination are so important. Supportive treatment is aimed at controlling the symptoms, and includes rest, fluids, and use of medicines to help relieve fever and aching. Certain medications should be avoided, such as aspirin or nonsteroidal anti-inflammatory drugs, which may increase the risk for bleeding. People with yellow fever should be protected from further mosquito exposure (for example, they should stay indoors or under a mosquito net) during the first few days of illness, so they do not contribute to the disease transmission cycle.It is believed that people who have had yellow fever develop lifelong immunity(10)

CONCLUSION

Yellow fever is an acute viral haemorrhagic disease transmitted by infected mosquitoes. The "yellow" in the name refers to the jaundice that affects some patients. Symptoms of yellow fever include fever, headache, jaundice, muscle pain, nausea, vomiting and fatigue.

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