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### **YELLOW HAEMAGOGUS: WIPING OUT MANY CIVILIZATIONS: A REVIEW**

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#### **Abstract**

*Yellow fever is a viral infection, which is continuously causing disease in tropical regions such as America and Africa. The virus, which causes Yellow fever is called as flavivirus. YF predominantly distresses persons and cardinals. Infected mosquitoes are main source of transmission of YF. Vector of YF commonly called as yellow fever virus (YFV), can leads hazardous hemorrhagic and potentially fatal disease. There is great need of vaccination campaigns for appropriate control and prevention of this fatal disease. Major Outburst of this epidemic is mainly due to following reasons: (1) Aedes aegypti reinvasion: in area where urban settings are made (2) Rapid moving of rural people to urban areas (3) diminished Immunity in living organisms. Effective and modern vaccinations are available but more updated information is needed to target specific zones of world which are at high risk of YF. The target of this study was to estimate the Cause, life cycle, diagnosis, treatments of YF virus and to gather optimal control and prevention strategies. However, it is concluded that YF had been rapidly emerging and highly fatal disease in humans and non-human primates throughout the civilizations*

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#### **1. Introduction**

Yellow fever is viral infection caused by female mosquito vector belongs to *Aedes and*

*Haemagogus spp.* This virus transfers when infected mosquito bites target organisms. The virus “flavivirus” is responsible for cause of infection. It belongs to family flaviviridae (Irimia and Gottschling, 2016).

Viral hemorrhagic fever commonly called as Yellow fever is known with high mortality rate mainly transmitted by mosquitoes. The Occurrence of this disease is only confined to Central and South America and Asia. Huge outbursts happened in North America and Europe. Yellow fever never occurred in Asia that is why Asia is the easy target for YF to spread. The virus rapidly disseminate in the region where it never occurred before. Rapid spreading of disease leads to failure of strategies of vector control once successful for eradication of virus from several regions, causing to recurrence of disease (Barnett, 2007).

Yellow fever can be prevented by immunization and supplements with prevention of mosquito bites (Wachkoo and Bharti, 2014). In 2013, yellow fever caused many deaths mainly in African region. This infection is common at the places where billion of people live. It is believed that few people are immune of this virus, some people are migrating because of changing climate which increase the risk of yellow fever. It was first time pointed out in Africa, several people died due to this infection, mainly in America, Africa and Europe then in 18 and 19 century yellow fever was the most dangerous human isolated virus. In 1927 yellow haemagogus virus was discovered. (Bandzuh et al., 2017).

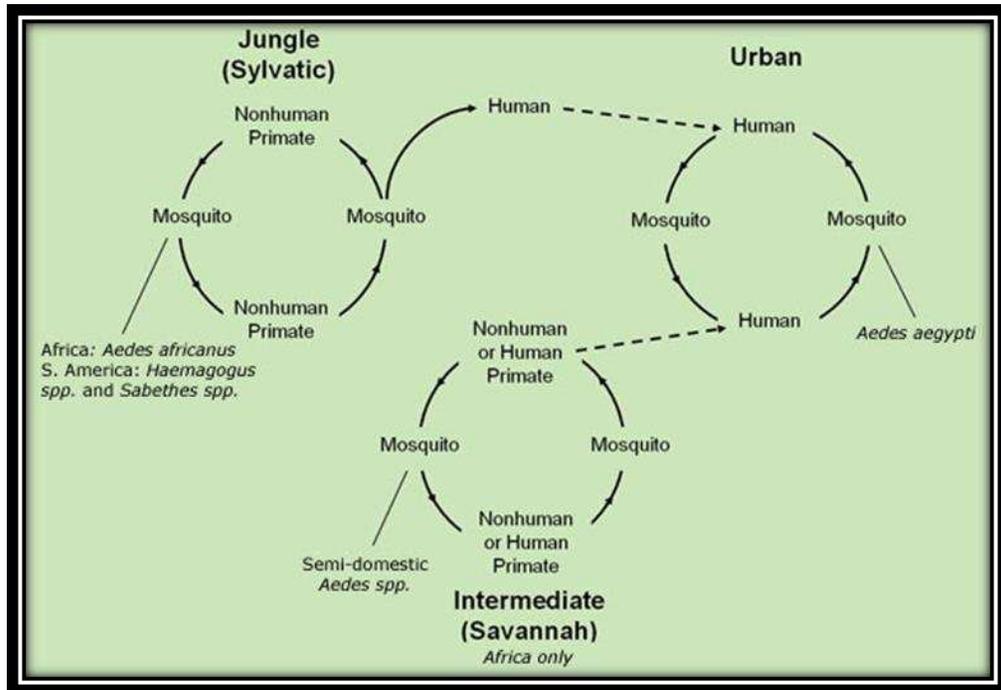
### **1.1 Virus transmission**

Yellow fever can be treated through vaccination. People, which are infected due to virus, are infectious through mosquitoes followed by fever for up to 5 days. There are three different ways yellow fever can be transmitted:-

- Jungle cycle
- Inter-mediate cycle
- Urban cycle

#### **1.1.1 The jungle or (sylvatic) cycle**

It transmit virus between non-human primates (e.g., monkeys). Monkey to the human transmits the virus by the help of mosquitoes (Azdevedo et al., 2013).



**Fig 1: The Cycle through which fever transmits**

Source Reference: <https://www.cdc.gov/yellowfever/transmission/index.html>

### 1.1.2 An intermediate (savannah) cycle

In this phase, mosquito transmits YF virus from infected human to monkey or from monkey back to you humans. (Conghaile, 2015).

### 1.1.3 The urban cycle

It includes trans-mission of the virus between humans and city mosquitoes, primarily *Aedes Aegyptus*. A viremia human who was infected in the jungle or savannah usually brings the virus to the urban setting (Azdevedo, 2013; Conghaile, 2015).

## 1.2 Sign and symptoms

It initiates after the incubation period of three to six days. Sign and Symptoms begin to appear in is incubation period. Few of them are mentioned over here:

- Headache
- Muscles pain
- Joint pain

- cold
- Temperature
- Jaundice

### **1.3 Acute phase**

This phase lasts for some days. The following are the symptoms, which are common in this phase.

- Headaches
- Muscles pain
- Joint pain
- Fever
- Flushing
- Loss of appetite
- Shivers

The patient will recover from this phase but some has to face serious conditions.

### **1.4 Toxic phase**

The symptoms can reappear within 24 hours of acute phase, which can be more serious than previous ones. It was noticed that only 15% of the persons get to enter this phase. It includes:

- Decreased urination
- Abdominal pain
- Vomiting
- Heart beat problem
- Bleeding from nose, eyes, and mouth

### **1.5 Causative agent**

The causative agent of yellow fever is, Flavivirus Fibricus, it is enveloped, spherical, and about 50nm in diameter RNA virus (Calkins et al., 2015). The protein on the surface are arranged in *icosahedral*-like symmetry. It shares specific antigen with the member of its genus.

#### **Yellow Fever (Epidemiology)**

According to literature, In YFV epidemiology mosquito-borne transmission is done to primate hosts. Flavivirus is transmitted to vertebrates by the arthropod bite primarily ticks and mosquitoes. YFV is not contagious despite of presence of virus in bodily secretions even at acute stages. Large populations of vectors and virus is outbreak of YFV epidemics. Trans viral and Vertical virus transmission for maintenance is important in mosquitoes

(Rosen 1981; Rosen 1987).

The reservoir of this infection are mainly monkey and the forest mosquitoes. However, in some areas the reservoir is the man another is the *Aedes Aegypti* mosquito (Beaty et al, 1980).

### **1.5. Period of symptoms' appear**

Symptoms begins when the blood of men starts infected and the virus and multiply in the body of patient.

### **1.6 Pathogenicity**

As the virus transmits into the human body, it replicates in lymph nodes and affects the immune cells. It enters into the liver causes liver inflammation or necrosis and infect hepatocytes, which can lead to degradation of cells eosinophil's and release of interferon (Moreira-soto *et al.*, 2018).

### **1.7 Diagnosis**

The diagnosis of the patient is based on clinical features or the epidemiologic history of the patient location that where person live. The blood serum of the patient is tested to check the specific virus *IgM* and antibodies. While in fetal cases, amplification of nucleic acid and histopathology with chemistry of immune system and the virus will be cultured from biopsy or autopsy tissues and then checked in laboratory. Early serological testing is performed by using *IgM*-capture *ELISA*, *MIA* (microsphere- based immunoassay) and *IgG ELISA* (Chang, 2000).

In case after one week of illness, virus presence is not confirmed, the verification of disease can be attained from PCR and another direct way is to culture the virus on culture media using blood plasma. The result can be obtain from 1-4 weeks after diagnosis differentiates the yellow fever from feverish illness such as malaria and other viral hemorrhagic fever (Moreira- soto *et al.*, 2018).

### **1.8 Treatment**

- There is no medicine to treat or cure yellow fever (Irimia and Gottschling, 2016).
- Medicine like painkiller or medicine that reduce fever for instance, paracetamol or ibuprofen (Irimia and Gottschling, 2016).
- The patient has to avoid some medicine like aspirin and no steroidal anti-inflammatory drugs.
- Water level in body should be maintained (Bonnet *et al.*, 2006).
- Patient has to e hospitalized for close observation (Chang, 2000).

### 1.9 Prevention

The prevention includes vaccination and avoiding mosquito bites in the area where this infection is endemic. The following are the some of the prevention:

- When outdoor use insect repellent on exposed skin.
- Wear clothes that cover whole body
- Staying indoors or air condition places (Conghaile, 2015)

### 1.10 Vaccination

Safe and effective yellow fever vaccines are present from long time:

- A single dose provide a lifetime protection.
- The vaccine recommended for aged 9 month and if the person is traveling to the place, where the yellow fever is present.
- Staying in protected or air condition room (Moreira- soto *et al.*, 2018)

### 1.11 Epidemiology

People who have not been vaccinated against virus and live in such areas where infected mosquitoes are present are at risk. According to the World Health Organization, an estimated 200,000 people get victimized by virus each year. Most cases occur in 32 countries in Africa and in 13 countries in Latin America, including;

- Bolivia
- Brazil
- Colombia
- Ecuador
- Peru

### 1.12 In Pakistan

There is no risk of yellow fever in Pakistan. This vaccination is only needed when someone travelling to such a place where yellow fever is present. This vaccination in only given when the person in traveling to any other country because this virus is find in tropical region.

### Conclusion

Yellow fever is a viral infection, which spreads by the mosquitos that act as vector for transmission of virus from monkey to human. It had been causing deaths in many people due to lack of medications and proper treatments. Medications and proper cure of Yellow fever is still not present but, certain vaccinations are available through which we can control its epidemics. Person should remain hydrated, and avoid to visit the places where

mosquitoes are present. In near future, scientists are struggling to discover effective vaccinations to control yellow fever just like polio mellitus.

## References

1. Azevedo, A. C. C., Porto, L. P. D. A., Silva, M. L., Martins, M. A., Avelar, R. S., Carvalho, A. T. D., ... & Martins, R. D. M. (2013). 17DD and 17D-213/77 yellow fever substrains trigger a balanced cytokine profile in primary vaccinated children.
2. Bandzuh, J. T., Juran, L., Kolivras, K. N., & Wallis, A. B. (2017). Local perceptions of measures to control Aedes mosquitoes and mosquito-borne diseases in Puntarenas and San Jose, Costa Rica. *Journal of Latin American Geography*, 16(2), 139-162.
3. Barnett, E. D. 2007. Yellow Fever: Epidemiology and Prevention. *Emerging infections*, 44: 850- 6.
4. Beaty, B. J., Tesh, R. B., & Aitken, T. H. (1980). Transovarial transmission of yellow fever virus in Stegomyia mosquitoes. *The American journal of tropical medicine and hygiene*, 29(1), 125-132.
5. Calkins, T. L., Woods-Acevedo, M. A., Hildebrandt, O., & Piermarini, P. M. (2015). The molecular and immunochemical expression of innexins in the yellow fever mosquito, Aedes aegypti: Insights into putative life stage-and tissue-specific functions of gap junctions. *Comparative Biochemistry and Physiology Part B: Biochemistry and Molecular Biology*, 183, 11-21.
6. Conghaile, S. O. (2015). Yellow fever vaccine. *Reactions*, 1533, 447-10.
7. Irimia, R. E., and Gottschling, M. (2016). Taxonomic revision of Rochefortia Sw.(Ehretiaceae, Boraginales). *Biodiversity Data Journal*, (4).
8. Moreira-Soto, A., Torres, M. C., de Mendonça, M. L., Mares-Guia, M. A., dos Santos Rodrigues, C. D., Fabri, A. A., ... & Drosten, C. (2018). Evidence for

multiple sylvatic transmission cycles during the 2016–2017 yellow fever virus outbreak, Brazil. *Clinical Microbiology and Infection*, 24(9), 1019-e1.

9. Rosen, L. (1981). Transovarial transmission of arboviruses by mosquitoes (author's transl). *Médecine tropicale: revue du Corps de santé colonial*, 41(1), 23-29.
10. Rosen, L. (1987). Overwintering mechanisms of mosquito-borne arboviruses in temperate climates. *The American journal of tropical medicine and hygiene*, 37(3\_Part\_2), 69S-76S.
11. Wachkoo, A. A., & Bharti, H. (2014). First description of the worker caste of *Nylanderia smythiesii* (Hymenoptera: Formicidae). *Biodiversity data journal*, (2).