

Review article on Pathogens Transmitted by Mosquitoes *Culex pipiens*.

Lujain Ibraheem Hussain, Hussein R.Mahmood, Ahmed Chead Auda

Faculty of sciences, University of AL-Qadisiyah ,Iraq

Corresponding author: hussain.mahmood@qu.edu.iq, lujain.hussain@qu.edu.iq

IN this article review, we will discuss the role of Mosquitoes in transmitting a large number of pathogens to human and animals...

Mosquitoes are a species of insects with a winged wing whose females absorb human blood and Since only female mosquitoes feed on blood because it is necessary for eggs to ripen,while the male feeds on the juices of plants and flower nectar. The female's mouth is characterized by being provided with fine parts that help puncture the skin and absorb blood (perforated sucking tongue).

The female's blood meal creates eggs, and the female lays eggs on top of the water, which is essential for hatching eggs. Rainwater pools, ponds, unused swimming pools, uncovered water tanks, leaching water and the like are all suitable places for laying eggs. The eggs hatch within a day or two and emerge from each egg a small caterpillar that is no more than one millimeter in length, has a head and a chest, and has bristles that help it float in the water in search of food from algae and microorganisms, and the larva breathes the air oxygen at the surface of the water. The mosquito cannot sting, because it cannot open its jaws. But they are stitched into the skin of their prey with six needle-like parts called nipples and are located in the center of Khartoum. These mosquitoes cover the lower lip. When seedlings are implanted and inserted into the skin, they are considered to be bloody feeding, the lower lip bends and slides upward away from the road, then the saliva flows into the animal's body through channels formed by the creams, and saliva prevents blood clotting, which makes the mosquito easily absorb it. The majority of people are allergic to mosquito saliva. As a result, itchy boils on the skin called mosquito bite abscesses arise. When the mosquito sucks enough blood, it slowly pulls the pods from the body, and then slides down the lower lip to take its previous position over the pods, and then flies.

Key words: Filaria ,Mosquitoes , Transmission, Viruses

Pathogens transmitted by mosquitoes as the following:**Lymphatic Filariasis (LF)**

The main cause of elephantiasis is a parasite of the family of filariasis and the following parasites cause this disease

Wuchereria bancroft

Brugia malayi

Brugia timori

(WHO, 2012)

This parasite transmits the following types of mosquitoes

Anopheles

culex

Aedes

Mansonia

And while feeding these species on human blood, the parasite enters the bloodstream.

This parasite is spread in sub-Saharan Africa and Southeast Asia

The disease is chronic when the parasite is in the lymphatic vessels and microfilaria spread in a course Blood, symptoms include fever, regression lymphadenitis, thickening of the skin and essential areas, due to parasites blockage by the system (lymphoid) by parasites (Díaz-Menéndez et al., 2011).

Eastern Equine Encephalitis Virus (EEEV)

Arbovirus viruses are virus-transmitted diseases that are transmitted by arthropods (ticks or mosquitoes), and transmission of infection occurs in mosquitoes with salivation while absorbing blood from a host (Weaver and Barrett, 2004). (EEEV) is a veterinary and human pathogen that belongs to one of seven antigenic complexes in the genus *Alphavirus*, the *Togaviridae* family. Sudden encephalitis can appear or appear a few days after systemic disease, and death occurred 2-10 days after symptoms appeared Horse mortality **The injury rate for survivors suffering from a neurological disorder ranges between 90 - 66%, while the death rate is estimated to be 30 and it may reach 50 for half of those recovered (Sidwell and Smees, 2003).**

Japanese encephalitis (JEV) virus

The cause is the head of the mosquito bite of the virus-carrying mosquitoes. The infection occurs when it reaches the stem cells of the skin. The antigenic cells of the virus carry the virus to the peripheral lymph nodes and viral spread occurs within the macrophages and peripheral lymphatic system organs (Sapkale et al., 2007). The main

bacterial vector, *Culex tritaeniorhynchus*, usually breeds in rice fields, where maid birds are often found, and thus JEV is mostly considered important in rural areas (Halstead and Jacobson, 2003). JEV belongs to the viral family of *Flaviviridae*, which consists of three genera: *Pestiviruses*, *Hepaciviruses* and *Flaviviruses* (Unni et al., 2011), the latter of which is also named after the B group. *Arboviruses* B. JEV begins classically with symptoms of fever, headache, and intestinal intestine, followed by retrograde consciousness. The incubation period is usually seven days, and in some cases it lasts for two weeks and two days, and sometimes a stiff neck occurs in half of the cases., and direct infections of fever and spasms may occur in children, and are usually the most severe pulse features (McKinsey et al., 2006).

WNV (the virus of West Nile)

According to the molecular and genetic identification ,This virus belongs to the RNA viruses genus *Flavivirus* (Mukhopadhyay et al., 2005), this virus is mainly spread among mosquitoes and wild birds, more than 40 species of mosquitoes, The major mosquitoes in the transmission of WNV belong to the genus *Culex*, especially *Cx. pipiens* (Fonseca et al., 2004). Symptoms of the infection vary depending on the individual immune response. The infection severe, symptoms can be seen such as the

Headache

Fever

Vomiting

Diarrhea

acute pains in abdomen .The most dangerous syptoms are

confusion

consciousness

Aeakness in muscles

Unthinking

(Petersen et al., 2013)

This virus transmits to human by blood and organ transplant but the most important vector for him is Mosquitoes where transmit by their bites (Petersen et al., 2016).

References

Díaz- Menéndez, M.; Norman, F.; Monge-Maillo, B.; Perez-Molina,A. and Lopez-Velez, R. (2011). Filariasis in clinical practice. *Enfermedades infecciosas y microbiologia clinica*, 29 (5): 27-37.

Fonseca, D. M.; Keyghobadi, N.; Malcolm, C. A.; Mehmet, C.; Schaffner, F.; Mogi, M. and Wilkerson, R. C. (2004). Emerging vectors in the *Culex pipiens* complex. *Science*, 303 (5663): 1535-1538.

Halstead, S. B. and Jacobson, J. (2003). Japanese encephalitis. *Advances in virus research*, 61: 103-138.

Petersen, E. E.; Staples, J. E.; Meaney-Delman, D.; Fischer, M.; Ellington, S. R.; Callaghan, W. M. and Jamieson, D. J. (2016). Interim guidelines for pregnant women during a Zika virus outbreak-United States, *Morbidity and mortality weekly report*, 65 (2): 30-33.

Petersen, L. R.; Brault, A. C. and Nasci, R. S. (2013). West Nile virus: review of the literature. *The Journal of the American Medical Association*, 310 (3): 308-315.

Sapkal, G. N.; Wairagkar, N. S.; Ayachit, V. M.; Bondre, V. P. and Gore, M. M. (2007). Detection and isolation of Japanese encephalitis virus from blood clots collected during the acute phase of infection. *The American journal of tropical medicine and hygiene*, 77 (6): 1139-1145.

Sidwell, R. W. and Smee, D. F. (2003). Viruses of the Bunya- and Togaviridae families: potential as bioterrorism agents and means of control. *Antiviral research*, 57 (1): 101-111.

Unni, S. K.; Ruzek, D.; Chhatbar, C.; Mishra, R.; Johri, M. K. and Singh, S. K. (2011). Japanese encephalitis virus: from genome to infectome. *Microbes and Infection*, 13 (4): 312-321.

Weaver, S. C. and Barrett, A. D. (2004). Transmission cycles, host range, evolution and emergence of arboviral disease. *Nature reviews. Microbiology*, 2 (10): 789-801.

World Health Organization (2012). Lymphatic Filariasis. <http://www.who.int/mediacentre/factsheets/fs102/en/>