New Microbes and New Infections 60–61 (2024) 101452

Contents lists available at ScienceDirect

New Microbes and New Infections

journal homepage: www.journals.elsevier.com/new-microbes-and-new-infections

Letter to the Editor

The unseen peril: Jordan's vulnerability amid the ongoing West Nile Virus fatalities in Palestine

ARTICLE INFO

Handling Editor: Patricia Schlagenhauf
Keywords
West Nile Virus
Jordan
Migratory Birds
Zoonotic Disease
Flavivirus

Dear Editor,

West Nile Virus (WNV) is a widespread mosquito-borne zoonotic flavivirus that circulates in the Eastern Mediterranean Region (EMR), in addition to many other parts of the world including Africa, America, Australia, West Asia, and parts of Europe [1]. Various avian species are considered the reservoir for WNV, while humans act as the incidental dead-end hosts, and do not contribute to further viral transmission except very rarely via routes like blood transfusion, organ transplantation and mother to baby, however, these routes have an extremely low risk of transmission [2]. Additionally, horses were found to be incidental dead-end hosts for the virus. WNV is transmitted to humans through infected mosquitos (primarily *Culex* mosquitoes) which capture the virus from birds [3]. The activity of these mosquitoes; thus, the WNV transmission potential, peaks in summer through fall seasons. Fig. 1 illustrates the transmission cycle of WNV.

Among immunocompetent people, most infections with WNV are asymptomatic, while around 20 % of people who capture the virus develop a mild febrile illness. This mild form of the disease is called West Nile Fever (WNF). Nevertheless, a more severe form of the disease may affect 1 % of infected people and leads to a fatal neurological form of illness which is referred to West Nile Neuroinvasive Disease (WNND). WNND may manifest as meningitis, acute flaccid paralysis, or encephalitis. Symptomatic infections caused by WNV may manifest with non-specific symptoms like nausea, diarrhea, vomiting, fever, rash, headache and body aches. The non-specific flu-like symptoms impose a significant challenge to healthcare providers in distinguishing WNV from other common viral infections based solely on clinical symptoms, that is why additional laboratory tests are needed to accurately diagnose and manage the cases properly.

Evidence shows that WNV is found in many countries in the EMR such as Jordan, Palestine, Lebanon, Qatar, Yemen and many other countries. Many countries in the EMR are on the fly path of migratory birds, putting these countries at higher risk of WNV transmission through mosquitoes that feed on infected migratory birds. Recently, an outbreak of WNV was announced in Palestine which as of July 09, 2024 has resulted in 300 cases with 15 fatalities.

Jordan, a middle-income country in the EMR, is located along major migratory routes for birds traveling across Asia, Africa and, Europe. These migratory birds travel vast distances and can carry WNV across various continents. The birds often stop at various points along their migratory routes, including Jordan and neighboring countries, where they can transmit the WNV to local mosquito populations. A study that was published in 2018 revealed that the point seroprevelance rate of WNV infection in Jordan was about 8.61 % (among 801 healthy human participants). People residing in Jordan valley and Badia were found to have higher WNV seropositivity compared to those living in highlands and plains areas [4]. Another study which was conducted among 253 horses revealed that 63 horses were found to be seropositive for WNV, especially horses in Jordan valley and Balqa regions [5].

WNV is a silent public health threat in Jordan, and could be considered as a zoonotic disease of national significance, however, this virus is still not considered as a priority zoonosis in the country. Implementing a One Health approach can strengthen Jordan's preparedness and response against WNV, consequently, reducing the possible impacts of this zoonotic disease on human and animal health. Collaboration between various Jordanian ministries such as Ministry of Health, Ministry of Environment, Ministry of Water and Irrigation, and Ministry of Agriculture play pivotal role in mitigating the risks of WNV transmission in the country. Recommended steps include fostering event-based surveillance and early warning systems (e.g., integrated surveillance system that monitor WNV in mosquitoes and migratory birds, inter-agency collaboration among various public health and one health stakeholders in Jordan), vector control (e.g., implementing control measures on mosquitoes breeding sites), wildlife and domestic animal monitoring (e.g., monitoring of migratory birds which act as the reservoir for WNV, monitoring of domestic animals to examine local viral circulation), public education and awareness regarding routes of transmission of WNV and various preventive measures, capacity building of healthcare workers, veterinarians, and environmental health specialists, and fostering research on local mosquito populations, migratory birds and climate factors that facilitate WNV transmission in Jordan.

https://doi.org/10.1016/j.nmni.2024.101452
Received 6 July 2024; Accepted 8 July 2024
Available online 10 July 2024

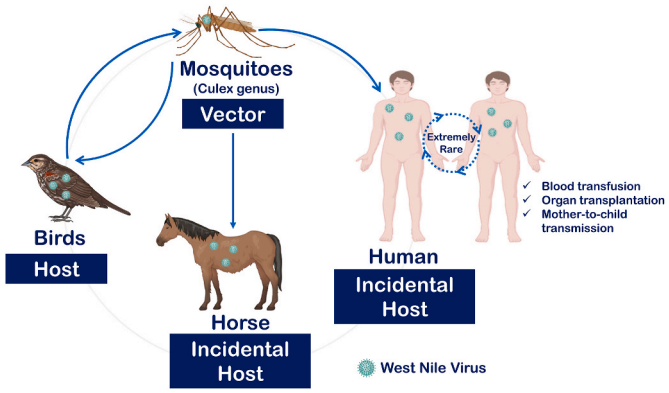

Fig. 1. Transmission Cycle of West Nile Virus (WNV). Human to Human transmission via Blood Transfusion, Organ Transplantation, and Mother to Baby is extremely rare.

CRediT authorship contribution statement

Ala'a B. Al-Tammemi: Conceptualization, Data curation, Supervision, Validation, Writing – original draft, Writing – review & editing. **Bilal Shtaiyat:** Conceptualization, Data curation, Writing – original draft, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgment

The authors extend their appreciation to Ms.Hanan Hasan for her efforts in creating Fig. 1 in this paper.

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