

# A travel-related infection case associated with triple vector-associated infections: Malaria–Dengue–Zika virus

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## Abstract

As international travels and destinations increase, travel-related infections increase. It is reported that 6–87% of the travellers contract travel-related infection during or after the trip. Vector-associated pathogens comprise a significant percentage of travel-related infections. Apart from the ubiquitous COVID19, threats such as Dengue, Chikungunya and Zika virus and tick-borne agents have emerged or re-emerged in recent years. The fact that these infections are carried with similar vectors and cause similar symptoms makes diagnosis difficult. Herein, a case of travel-associated infection with nonspecific symptoms is presented.

## Keywords

Malaria, Dengue, Zika virus, travel-related infection

## Introduction

Dengue, Chikungunya virus, Zika virus and tick-borne agents have increased in recent years.<sup>1–5</sup> Rarely, they may all present together, simultaneously or sequentially.

## Case report

A 30-year-old male with no prior known disease and a history of multiple international travel was diagnosed with malaria in Nigeria in October 2018. During that period, he had complaints of headache and shivering. *Plasmodium falciparum* was detected in his blood smears, and an unknown treatment was initiated. His complaints resolved. However, in July 2019, he was readmitted to a hospital in Nigeria with high fever, shortness of breath and bloody stool. Artemether-lumefantrine was started as it was considered to be a malaria relapse. Ten days later, after returning to Turkey, he was admitted to our clinic with mild dyspnoea and abdominal pain. A malaria relapse was diagnosed initially as *P. falciparum* trophozoites, which were morphologically deformed probably due to previous treatment, were observed in thin and thick smears of blood samples. Artemether-lumefantrine was restarted. He recovered from his symptoms. Recurrent symptoms appeared three weeks later, but at another clinic, no

trophozoite was detected in blood smear, and no treatment was started.

He returned to our clinic one month later with complaints of mild shortness of breath, dizziness, sweating and weakness in both arms and legs. He had been vaccinated against yellow fever before his last travel. His shortness of breath and sweating complaints continued despite three days of malaria treatment. For this reason, malaria treatment was stopped. Physical examination revealed no prominent pathology. His laboratory findings were as follows: aspartate aminotransferase: 0.27 $\mu$ kat/L, alanine aminotransferase: 0.25 $\mu$ kat/L, alkaline phosphatase: 0.9 $\mu$ kat/L, gamma-glutamyl transferase: 0.23 $\mu$ kat/L creatinine: 82.2  $\mu$ mol/L, C-reactive protein: 0.7 mg/L and erythrocyte sedimentation rate: 7 mm/h. No parasites were detected in thin and thick smears of blood samples.

Various viral infections were sought by testing for tick-borne Encephalitis virus IgM and IgG, Dengue virus IgM,

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IgG and PCR, Zika virus IgM and IgG, *Rickettsia conorii* IgG and IgM and *Rickettsia* PCR, *Leptospira* PCR and Chikungunya IgM, IgG and PCR.

Dengue virus antibody IgM was positive, Dengue virus antibody Ig G was positive, Zika virus IgM and IgG were positive, while the other results were negative. No specific treatment was given. At eight months' follow-up, headache and muscle weakness symptoms had resolved.

## Discussion

*Flaviviridae* including Dengue, Yellow Fever, West Nile and Zika viruses cause diseases in humans. The main vectors of Zika virus, Chikungunya virus and dengue virus are *Aedes aegypti* and *A. albopictus*. Their clinical courses show similar non-specific symptoms and clinical findings, typically fever, headache, muscle pain, arthralgia, maculopapular rash, retro-orbital pain and lymphadenopathies. Since they are clinically similar viruses, diagnosis is difficult without antibody tests.<sup>1</sup>

Turkey is a non-endemic country for both Dengue and Zika. Since IgM and IgG results were positive, we diagnosed both diseases according to Panamerican Health Organisation–World Health Organisation Guidelines for the serologic diagnosis of Zika Virus-2016 and Dengue haemorrhagic fever – Laboratory diagnosis – World Health Organisation.<sup>4,5</sup>

In conclusion, multiple agents may infect humans by vector-induced infections. Even if an infecting agent is detected, a history of recurrent admissions and a search for every potential endemic aetiology are advised.

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## References

1. Gul HC and Erdem H. Brucella species. In: Bennett JE, Dolin R and Blaser MJ (eds) *Principles and practice of infectious diseases*. Vol. 318. 9th ed. Philadelphia, PA: Elsevier, 2020, pp.3818–3827.
2. Kristina MA, Phyllis EK, Edward TR, et al. What proportion of international travellers acquire a travel related illness? A review of the literature. *J Travel Med* 2017; 1; 24.
3. Pepe F, Akıncı E and Bodur H. What to know about travel related infections. *Mediterr J Infect Microb Antimicrob* 2018; 7: 1.
4. Panamerican Health Organization – World Health Organization Guidelines for the serologic diagnosis of Zika Virus, 2016, [www.paho.org/hq/dmdocuments/2016/Guidelines\\_serological-diagnosis-of-ZIKV-infection-October-2016.pdf](http://www.paho.org/hq/dmdocuments/2016/Guidelines_serological-diagnosis-of-ZIKV-infection-October-2016.pdf) (2016, accessed 18 May 2020).
5. Dengue hemorrhagic fever – laboratory diagnosis – World Health Organization, [www.who.int/csr/resources/publications/dengue/034-47.pdf](http://www.who.int/csr/resources/publications/dengue/034-47.pdf) (2017, accessed 18 May 2020).