

## Mixed infection of *Plasmodium falciparum* and dengue virus: a case report from Garg Nursing Home, Neemuch, Madhya Pradesh

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**Background:** Malaria and Dengue, transmitted by the Female Anopheles and *Aedes aegypti* mosquitoes respectively, are significant global health concerns. Recent improvements in sanitation and mosquito control have reduced malaria cases in several parts of India. However, areas where both vectors coexist pose a risk of concurrent infections, complicating diagnosis and treatment. Falciparum malaria and Dengue are known for their severe complications, including cerebral malaria and bleeding tendencies due to reduced platelet count.

**Case presentation:** A 60-year-old patient presented with high-grade fever, severe headache, body aches, and dehydration. Despite prior treatment at a village clinic, the symptoms persisted and worsened. Upon admission, the patient exhibited high fever, rapid pulse, and mild dehydration. Further examination revealed no respiratory or cardiac issues, but severe headache persisted despite fever reduction. Symptomatic management commenced while awaiting test results. Lab reports indicated a positive result for *P. falciparum* antigen *via* immunochromatography.

**Conclusion:** This case underscores the necessity of testing for both malaria and Dengue in cases of acute high-grade fever to avoid missed diagnoses and untreated severe complications. Coinfection of *P. falciparum* and Dengue can intensify the severity and duration of both diseases, challenging accurate diagnosis and management. Vigilance in testing and reporting such cases is crucial for effective public health responses. The first documented case of malaria and Dengue coinfection dates back to 2005, highlighting the emerging nature of this phenomenon.

**Keywords:** *Aedes aegypti*, dengue, elisa, fever, malaria, *Plasmodium falciparum*

### Introduction

Malaria and Dengue, transmitted by the Female Anopheles and *Aedes aegypti* mosquitoes respectively (Shah & Mehta, 2017; Kaushik et al., 2017), are significant global health concerns. Recent improvements in sanitation and mosquito control have reduced malaria cases in several parts of India. However, areas where both vectors coexist pose a risk of concurrent infections (Charrel et al., 2005; Carme et al., 2009), complicating diagnosis and treatment. Falciparum malaria and Dengue are known for their severe complications, including cerebral malaria and bleeding tendencies due to reduced platelet count (Ward, 2006). Various diagnostic methods, such as immunochromatography and ELISA, aid in identifying these infections. ELISA is used to detect NS1 antigen against dengue virus (WHO, 2009).

### Case presentation

A 60-year-old patient presented with high-grade fever, severe headache, body aches, and dehydration. Despite prior treatment at a village clinic, the symptoms persisted and worsened. Upon admission, the patient exhibited high fever,

rapid pulse, and mild dehydration. Further examination revealed no respiratory or cardiac issues, but severe headache persisted despite fever reduction. Symptomatic management commenced while awaiting test results. Lab reports indicated a positive result for *P. falciparum* antigen via immunochromatography. Additionally, the peripheral smear examination revealed the presence of ring forms of *P. falciparum*. Moreover, the ELISA test confirmed the presence of NS1 antigen of the Dengue virus, also yielding a positive result. Complete blood count showed normal count with relative lymphocytosis with many activated lymphocytes seen in smear examination. The patient was treated for both infections by using recommended treatment.

## Discussion

Diagnosing and managing concurrent infections of *Plasmodium falciparum* and Dengue pose substantial challenges within the realm of tropical medicine and public health (Sahu et al., 2017). The difficulties arise primarily from the convergence of symptoms associated with these two prevalent diseases and the potential interactions between the respective pathogens. Both malaria and Dengue fever manifest with fever, headache, and myalgia, making it challenging to distinguish between the two solely based on clinical presentation. Moreover, the coexistence of these infections may not only intensify their individual severity but also induce alterations in symptomatology, further complicating accurate diagnosis and timely intervention. The intertwined nature of malaria and Dengue complicates treatment strategies, as some antimalarial and antiviral drugs may have overlapping or conflicting effects. This underscores the critical importance of precise diagnostic methods to differentiate between the infections and guide appropriate therapeutic interventions. In regions where both diseases are endemic, public health measures should emphasize comprehensive testing for both malaria and Dengue in individuals presenting with febrile illnesses. Such an approach is essential to not only provide accurate and timely treatment but also to prevent potential complications arising from misdiagnosis or inadequate management. The implementation of robust diagnostic protocols, coupled with an increased awareness among healthcare providers, can significantly contribute to the effective control and management of concurrent infections of *Plasmodium falciparum* and Dengue, ultimately reducing the burden on healthcare systems and improving patient outcomes in regions where these diseases coexist.

## Conclusion

This case underscores the necessity of testing for both malaria and Dengue in cases of acute high-grade fever to avoid missed diagnoses and untreated severe complications. Coinfection of *P. falciparum* and Dengue can intensify the severity and duration of both diseases, challenging accurate diagnosis and management. Vigilance in testing and reporting such cases is crucial for effective public health responses. The first documented case of malaria and Dengue coinfection dates back to 2005, highlighting the emerging nature of this phenomenon.

## Author contributions

VG: Coconceptualised this study and treated the case, KP: Written this article.

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## Funding

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## Conflict of interest

The author declares no conflict of interest. The manuscript has not been submitted for publication in other journal.

## Ethical concern

We have taken informed consent from the patient and also we have not disclosed the identity of the patient.

## Competing interests

The author declares no conflict of interest. The manuscript has not been submitted for publication in other journal.

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