

# A review: Misinterpretation and knowledge gaps in differentiating dengue and malaria

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## ABSTRACT

Malaria and dengue are both endemic vector-borne diseases. Malaria is a protozoal disease, whereas dengue is a viral disease; both are transmitted through mosquito bites. Malaria is transmitted by female *Anopheles* mosquitoes that carry *Plasmodium* species, of which four species *P. vivax*, *P. ovale*, *P. malariae*, and *P. falciparum* and a fifth species, *P. knowlesi*, is also a human pathogen but is less well known, whereas dengue is transmitted through female *Aedes aegypti* mosquitoes, which carry flavivirus serotypes DENV-1 to DENV-4. Although malaria and dengue are treatable but due to misinterpretation, misdiagnosis, inappropriate treatment, self-medication, lack of awareness, false results, knowledge gaps among individuals, myths or beliefs, and increasing drug resistance may worsen the condition and make both diseases life-threatening.

**Keywords:** Malaria, Dengue, misinterpretation, knowledge gaps.

## INTRODUCTION

Malaria and dengue both are most common diseases worldwide and a major leading cause of mortality. The word malaria comes from the Italian term *aria cattiva* or *mal'aria*, meaning 'bad air' [1]. Malaria is an ancient disease dating back to early China and Greece. Malaria is a protozoal disease belonging to genus *Plasmodium*. Its subspecies include *Plasmodium vivax*, *Plasmodium falciparum*, *Plasmodium malariae*, *Plasmodium knowlesi*, and *Plasmodium ovale*, all recognized as human

pathogens. Among these five, *Plasmodium falciparum* is the most fatal [2-5].

Dengue is known by different names such as dandy fever, el dengue and break-bone fever etc. Dengue is also an ancient disease, first identified in Africa. Dengue is caused by the dengue virus (genus *Flavivirus*), which has four serotypes: DENV-1, DENV-2, DENV-3, and DENV-4 [6].

Both malaria and dengue are vector-borne diseases transmitted through mosquito bites. Malaria is a protozoal infection caused by Female *Anopheles* mosquitoes, which can be

identified by their palps, whereas dengue is a viral infection caused by female Aedes mosquitoes, which have distinctive black-and-white patterns on their legs.

According to World Health Organization (WHO), malaria and dengue are both endemic in Pakistan and are life-threatening diseases. Approximately 77 percent cases are associated with Plasmodium falciparum, while about 23 percent are due to Plasmodium Vivax in 21<sup>st</sup> century. In contrast, over 80 percent of dengue cases are asymptomatic, meaning no clinical symptoms[7].

### **SYMPTOMS:**

The most common symptom shared by both malaria and dengue is high-grade fever. In malaria, the classic fever pattern may not occur daily; instead, temperature rises at specific intervals, and patients may experience lethargy, chills, fatigue, uneasiness, headache, and painful eyes.

In dengue, symptoms include vomiting, nausea, abdominal pain, skin rashes, diarrhea, retro-orbital pain, headache, hepatomegaly, and gum bleeding[8].

### **CLINICAL TESTING:**

There are numerous methods to diagnosing malaria, but the gold standard is microscopic examination by Giemsa-stained blood smears. Other diagnostic methods include indirect immune fluorescence antibody testing (IFA), enzyme-linked immuno sorbent assays (ELISA), and rapid diagnostic tests (RDTs), which are now widely used and have significant importance[9].

Diagnostic tools for dengue include NS1(non-structural protein-1), polymerase chain reaction (PCR), immunoglobulin M (IgM) testing, and complete blood count (CBC).

### **MISINTERPRETATION AND KNOWLEDGE GAPS:**

People often fail to differentiate between dengue and malaria because both diseases present with similar symptoms. Clinically, dengue and malaria are difficult to distinguish. If patients ignore their condition, both diseases may become fatal. Hematological parameters can help differentiate the two; in dengue fever, lymphocyte counts may significantly decrease, whereas in malaria, red blood cell (RBC) counts are generally lower than dengue fever[5].

In tropical regions, malaria and dengue are the two major arthropod-borne infectious diseases, mainly due to a lack of awareness. Even among those who are aware, diagnostic facilities are often limited. This is very important to check knowledge of different disease and educate people[10, 11].

### **TREATMENT:**

Fortunately, several anti-malarial and anti-protozoal medications are available for the management of malaria. These include chloroquine, a well-known oral anti-malarial drug used for non-resistant malaria, which works inhibiting the conversion of heme into hemozoin. It is also used as prophylaxis. Due to increased resistance in Plasmodium species, artemisinin-based oral therapies are now commonly used. Other drugs such as mefloquine, quinine, primaquine, anti-folates, and atovaquone-proguanil are also used, some

of which are effective against multidrug-resistant species of *Plasmodium*[12-14].

Unfortunately, dengue has no specific therapeutic treatment. It is managed through adequate fluid intake, rest, and close monitoring of platelets counts[5].

### **PREVENTION:**

Since malaria and dengue are mosquito-borne diseases, prevention mainly focuses on vector control. This includes the use of insect repellents, elimination of stagnant water, cover water storage containers, wear full-sleeved clothing, using bed nets, and ensuring early detection for timely and appropriate treatment[15].

### **PROPHYLAXIS:**

According to World health organization (WHO), there is currently one vaccine available for dengue, denga® (TAK-003). For malaria, vaccines such as RTS, S and R21 have been developed[16].

### **GENDER MOST EFFECTED:**

Malaria cases are more frequently reported in females, particularly pregnant women, due to compromised immune system, compared to non-pregnant women. Dengue, however, is more commonly reported in males[5].

Both malaria and dengue are more prevalent among individuals with greater outdoor exposure[17].

### **COMMON MYTHS:**

Common myths regarding malaria and dengue include the belief that vaccines are not available, that these diseases are contagious, that

mosquitoes only breed in dirty water, and that unhygienic food causes these infections.

In dengue, a decrease in platelet count leads many people to believe that excessive platelet transfusion is necessary for treatment. Another common belief is that papaya leaf extract can cure dengue fever; however, there is no scientific evidence supporting its effectiveness[18].

## **METHODOLOGY**

The literature survey was done from 1<sup>st</sup> January, 2026 to Feb, 2026. The search was done by means of in search engines like Google scholar, Web of science, Scoopus and Pub-med.

## **CONCLUSION**

In conclusion, malaria and dengue are two vector-borne diseases that share several overlapping symptoms, such as headache, lethargy, myalgia and pyrexia, which often lead to misinterpretation. Despite advancements in the modern era, knowledge gaps remain a major factor contributing to the spread of these ancient diseases. Misdiagnosis and false results can delay treatment and increase both mortality and morbidity[5].

This review highlights the importance awareness campaigns, healthcare workshops, and educational institutions in improving knowledge and differentiation between dengue and malaria[5].

### **Declaration of conflict of interest**

The authors declare no conflict of interest, financial or otherwise. No artificial writing assistance was utilized in the production of this manuscript.

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