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Highlights on the spread of dengue fever during the Sudan conflict and its oral manifestations

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Abstract
For many decades the Dengue Fever has been a serious health problem in Sudan; which is a viral disease transmitted to humans by the mosquito Aedesa egypti. In recent times outbreaks have occurred regularly posing extra challenges to the health system in Sudan which is already compromised by the ongoing conflict. This article aims to highlight the outbreak of Dengue fever during the Sudan conflict and to discuss the oral presentations of dengue infection. The most affected state by dengue fever is El Gedaref in Eastern Sudan according to the Ministry of Health in Sudan; this is due to the lack of herd immunity and the high density of mosquitoes. The presentation of dengue fever varies from asymptomatic infections to the hemorrhagic dengue fever, which is the most serious form. There is an urgent need for strategic implementation of prevention programs to prevent future outbreaks of dengue fever in Sudan and maintain adequate healthcare.

Keywords: Dengue fever, conflict, manifestations, Sudan, oral

Introduction

The ongoing devastating conflicts in Sudan which started in April 2023 have coincided with an outbreak of dengue hemorrhagic fever in Eastern Sudan. Due to the conflicts, the capital of Sudan Khartoum, and some urban areas have become battlefields, hospitals, and medical facilities have been destroyed and consequently are out of service [1]. The Dengue fever is a highly contagious viral disease especially during the season of rain when there are abundant Aedes aegypti mosquitoes which transmit the disease. Approximately 390 million infections across the world are caused by four serotypes of DENV virus (DENV-1–4) [2]. In the last 2 decades, repeated outbreaks of dengue occurred in Sudan and were reported in the following states; Port Sudan (2005 & 2010), Kassala State (2016 & 2017), El Obeid (2012 & 2013), and Darfur states. [3, 4] As of 20 October 2023 (3,414) cases and (38) deaths have been spotted by the Health Ministry in Sudan. Yet; the actual number of the cases is higher than the reported as many patients receive home remedies and do not go to hospitals [5]. High fever, pain behind the eyes, headache, rash, joints, muscles and bones pain are the common signs and symptoms of the disease. There are some reported nonspecific symptoms that may accompany the infection such as nausea, vomiting, diarrhoea and dizziness [6]. Oral manifestation usually occurs as secondary findings to the general symptoms [7]. Morbidity and mortality can result from under-recognition of the disease, yet patient outcomes are improved through early detection. This commentary aims to discuss the clinical and oral manifestations of the disease and to address the various challenges of implementing health measures against Dengue Fever in Sudan amid the conflicts.

Challenges facing the health system in Sudan during the conflicts

Sudan has been experiencing unprecedented disruptions in basic public health services, such as disease surveillance, rapid response teams, and functions of public health laboratories since the start of the conflicts. Lack of security is another challenging issue that exists across the country, therefore many people have been forced to leave their homes from the fear being killed or raped or kiddnaped. Absence of the basics of living is also main obstacles in some areas such as electricity, water, medications with scarcity of food. The percentage of people in the community with no access to medical care is 65%; this is attributed to the fact that 70 - 80 % of hospitals are no longer functional [1]. In the middle of the current situation, disease outbreaks are increasing day after day. The Ministry of Health reported several outbreaks of measles, malaria, cholera, and dengue fever in some different parts of the country [5]

A report published on October 28 2023 recorded the death of 49 people in Sudan, including 33 in Gedaref State, east of the country, as a result of dengue fever, noting that it had recorded 3,316 cases of the disease, including 2,152 cases in Gedaref [5].

The current situation of conflict makes fighting the causes of infection, providing health services and aids extremely difficult. In addition, the unavailability of reliable laboratories to document cases, making the documenting of accurate statistics hard. Moreover there is lack of funding for the disease's eradication campaigns from the government and inaccessibility of humanitarian aids from organisations.

Clinical features of dengue fever

Symptoms from the infection vary from mild to intense and potentially fatal. Children usually experience mild symptoms and the dangerous form of dengue Hemorrhagic Fever [8]. According to the WHO, the dengue fever infection is expected if high fever is present with at least two of these symptoms include pain behind the eyes, headache, rash, joints, muscles and bones pain, high white blood cells count, decrease in the platelet count [8] Vascular permeability, haemorrhage, organ failure, plasma leakage, and shock can occur in some cases [9].

Oral manifestations of dengue fever

Lesions in the oral cavity serve as early signs of Dengue infection, therefore the role of dental care providers is substantial for both the identification and guidance of the patient for the proper treatment. Tongue petechiae, gingival bleeding, ecchymosis and erythema are usually detected in the mouth of infected person [10] Other signs that may also be seen include lips and tongue detachment, blisters on soft palate, hemorrhagic pimples on the tongue's borders and mouth's floor. Purpura, Xerostomia, tongue coating, nasal bleeding, inflamed tonsils gum bleeding and hemorrhagic plaques have been reported [11, 12]. Further manifestations include swallowing difficulty, lingual hematoma, oral candidiasis, dentoalveolar osteonecrosis, and osteonecrosis of the jaw [13].

Diagnosis of dengue fever

After careful monitoring of the symptoms and signs, some tests must be adopted to accurately verify the presence of the dengue's virus and also allow early and rapid identification and hence management. Some of the diagnostic tests are isolation of the virus, NS1 antigen serology and antibody (IgM and IgG) detection [14].

Treatment of dengue fever

There are no specific existing cures for Dengue Fever. Supportive treatment helps in reducing the complications and severity of the disease. The drug carbazochrome sodium sulfonate has been explored by many clinical trials with no evidence of benefit. Fluid therapy is crucial in mild cases, yet in cases of significant dehydration (>10% of normal body weight), hospitalization is recommended [15]. During the management of dengue fever patients, the following should be avoided; NSAIDs/aspirin, Steroids, antibiotics, nasogastric tubes, and drugs causing renal, hepatic, and haematological toxicity. Dentists should take an appropriate medical history and be aware of the possible complications resulting from dental procedures in Dengue Fever patients since haemorrhage is a distinct feature of the disease [8].

Prevention and vaccination

During the past years the incidence of Dengue fever has increased by threefold. The recorded cases was 505.430 in the year 2000 then the number has dramatically increased to reach 4.7 million in the year 2024 with Latin America and the Caribbean having most of the cases. The majority of the cases are asymptomatic or mild and self-managed. WHO has published comprehensive guidelines for preventive measures to reduce dengue fever spread Accurate monitoring programs for virus transmission must be implemented by health authorities especially in high prevalence areas [16, 17].

Mosquitoes are widespread in densely populated areas therefore; Mosquito repellents, mosquito repellent creams can also be used also the use of mosquito net during sleep is beneficial. Additional preventive measures are keeping houses ventilated and exposed to the sun, wearing long-sleeved shirts and long pants, and using air conditioning or windows and doors screens to keep mosquitoes out. Extra efforts for combating the mosquito vector (Aedes aegypti) must be made and it's a very effective method for disease prevention. This can be achieved through the following reduction of larvae as it serves as a habitat for A.aegypti, eliminating water containers, public education, and law enforcement [17].

Vaccination should be included in the Prevention and control strategy. The only available vaccine for Dengue infection is Dengvaxia®, yet there are several vaccine candidates in clinical development. 9 to 45 years is the indicated age range for the vaccine. A three-dose series of Dengvaxia® given 6 months apart is recommended [18].

Recommendations

- The current conflict in Sudan has led to the compromisation of healthcare quality in most states therefore, health authorities should make efforts to reconstruct the public hospitals and provide them with the necessary supplies.
- Adherence to the guidelines set by WHO for the prevention of Dengue fever [16].
- Breaking the chain of infection through vaccination is quite important.
- The common site of haemorrhage is the oral cavity, therefore the dentist should pay attention to any abnormal findings.
- Improving the Community's awareness level about the disease and methods of its prevention
- Implementation of all vector control measures.

Conclusion

In many cases oral manifestations may be the only indicator of dengue infection. Therefore dentists need to be knowledgeable about them for accurate identification and correct management.

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Authors contributions

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