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Dengue fever and its oral manifestations: A literature review

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Abstract
The Flaviviridae family's RNA virus causes dengue, which Aedes insects carry. Asymptomatic fever to shock and hemorrhagic fever are possible presentations. Cute-onset high fever, myalgia, cutaneous rash, muscle and joint pain, hemorrhagic episodes, and circulatory shock are common. Although rare, oral dengue symptoms might occur when they are the only symptom. Early and accurate diagnosis reduces mortality. Dengue infection is a public health issue in tropical and subtropical nations, even though it usually goes away on its own. This article thoroughly covers dengue virus infections, oral symptoms, and treatment.

Keywords: Dengue fever, dengue virus, oral manifestation

Introduction
In the medical field, dengue fever has become a recurring problem. The rise of dengue cases among its many clinical symptoms, shock syndrome (DSS) presents a challenging issue due to its medical condition, which calls for accurate knowledge, timely diagnosis, effective treatment, and a coordinated approach [1].

In the absence of a vaccine or particular antiviral treatment for dengue fever (DF) and DHF, preventive efforts diminish Aedes aegypti and Aedes albopictus vector populations. Insecticides, public awareness, and Aedes albopictus and aegypti larvae surveillance are the main ways tropical nations control DF/DHF. Since there is no dengue antiviral medicine, developing a vaccination is a priority. Five dengue vaccines are being developed: DNA, live attenuated virus, recombinant subunit, viral vector, and inactivated virus [2].

When DSS develops, the intensity of dengue fever escalates to dangerous levels, typically leading to shock, bleeding, and organ failure. Dengue fever is a debilitating sickness that produces fever, headache, joint discomfort, and skin rash. The transition from a moderate dengue infection to the essential stage of DSS involves a complex interaction involving viral dynamics, the body's immune responses, and the resilience of blood vessels. This makes DSS an intriguing but puzzling conundrum in infectious illnesses [3, 4].

A sudden feverish illness is the hallmark of dengue viral infections, but they can also result in serious morbidity and fatality. As a result, an accurate and timely diagnosis is necessary. The most common dengue mouth symptom is gingival hemorrhage. Many haematological and biochemical tests may help diagnose and treat the dangerous condition. Oral lesions from dengue infections are infrequent but can be mistaken as hemorrhagic illnesses or platelet abnormalities [5]. This article thoroughly covers dengue virus infections, oral symptoms, and treatment.

Pathophysiology of Dengue fever: The dengue virus enters the host through the epidermis after biting an infected insect. The virus's rapid departure from the host body causes more severe clinical symptoms due to innate, cellular, and humoral host immune responses. Thus, a high viral load does not predict the most severe clinical presentation during infection [6]. The path from dengue infection to the onset of DSS begins when the virus enters the body for the first time. This sets off a synchronised sequence of immunological reactions.

When the virus establishes itself, immune cells initiate a complex interplay of cytokines and chemokines that result in inflammation and activate the immune system. Occasionally, this immune response can become overactive, leading to endothelial dysfunction and increased permeability of blood vessels. Hypovolemic shock, or decreased blood volume, is the hallmark of DSS and plasma loss, and occurs when fluid diffuses from blood arteries into adjacent tissues [7].

Clinical manifestations: The early stages of dengue usually involve severe feverish illness with vague symptoms as headache, lethargy, nausea/vomiting, abdominal pain, and rash. The majority of DF patients have retro-orbital discomfort, myalgia, and arthralgia; some DHF/DSS patients may too. In busy primary care or outpatient departments, medical practitioners sometimes ignore petechiae and other bleeding symptoms (epistaxis, bleeding gums, hematemesis, melena, hypermenorrhea, hemoglobinuria) that help discover suspected dengue. Dengue can be diagnosed early with the tourniquet test [8, 9].

A patient is suspected of having dengue infection if they have a high fever and two of the following signs or symptoms, under the WHO 2011 case criteria.

- Headache
- Retro-orbital pain
- Myalgia
- Arthralgia/ bone pain
- Rash
- Bleeding manifestations: petechiae, epistaxis, gum bleeding, hematemesis, melena, or positive tourniquet test.
- Leukopenia (WBC $\leq$ 5,000 cells/mm^3)
- Platelet count $\leq$ 150,000 cell/mm^3
- Hematocrit (Hct) rising 5–10% [10, 11].

Oral manifestation of dengue fever: Oral traits are associated to DHF more than dengue. Erythema, lip crusting, tongue, and soft palatal vesicles are dengue virus oral symptoms. Multiple hemorrhagic bullae on the floor of the mouth, lateral surface of the tongue, and sublingual mucous membrane; brown, rough-surfaced plaque-like lesions on the buccal mucosa that bled spontaneously from the tongue and gingiva; petechiae, purpura, ecchymoses, and nasal bleeding were reported by Byatnal [12]. Hemorrhagic plaques, swollen tonsils, and bleeding gums were seen in a dengue-infected patient by Mitra *et al*. It is uncommon to experience isolated hypoglossal nerve palsy after contracting dengue fever. Changes in taste, redness of the conjunctiva, and lymphadenopathy [13].

Diagnosis: Clinical management depends on precise and efficient dengue diagnosis (early detection of severe cases, case confirmation, and differential diagnosis with other infectious diseases). In a lab, the dengue virus, its nucleic acid, antigens, antibodies, or a combination of these can be detected. The virus is present in serum, plasma, circulating blood cells, and other organs for four to five days after disease onset. Nucleic acid or antigen detection, viral isolation, or both can detect the infection early. Serology is preferred for post-acute infection diagnosis [1].

Management of dengue fever: Fluid replenishment and paracetamol are advised after fever. Avoid further nonsteroidal anti-inflammatory drugs. Adjudicious fluid injection is key to infection care. Normal saline, Ringer's Lactate, and 5% glucose diluted 1:2 or 1:1 in plasma, plasma replacements, or 5% albumin are frequently provided. A critical patient with low platelet counts should be concerned about bleeding. Suspected bleeding situations benefit most from fresh whole blood transfusions [14].

Dental management: Oral lesions are infrequent occurrences that are often mistaken as platelet abnormalities. Platelet transfusions are deemed imperative in instances characterized by severe hemorrhagic manifestations. The delivery of prophylactic platelets is typically deemed unnecessary, even when the platelet count is below 20,000 per cubic millimeter. In the absence of observable hemorrhaging, it is permissible to deliver prophylactic platelets at a dosage below 10,000/cu mm. In instances of systemic severe bleeding, there may be a necessity for red cell transfusion and platelet transfusion. It is imperative to engage in the monitoring of liver functions [14].

Conclusion

In the post-monsoon season in India, there has been a rapid and widespread transmission of the potentially life-threatening viral illness known as dengue. In instances of heightened severity, there exists an association with thrombocytopenia, myalgia, arthralgia, as well as non-specific manifestations of fever and rashes. While oral manifestations of dengue infection are infrequent, there are instances where oral features may manifest as the sole presenting symptom. The imperative to decrease mortality necessitates the timely and accurate identification of medical conditions.

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