

# Ebola virus infection: Its implications in dentistry

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## ABSTRACT:

*The incidence of infectious diseases in humans has increased in the recent past and threatens to increase in the near future. Ebola virus infection unlike other dangerous diseases which are blood borne can be endemic and may emerge as sporadic outbreaks causing worldwide concern as proven by its current outbreak in Africa. Health care professionals are at the leading edge of getting infected with these diseases from the affected individuals. Although dentists do not involve directly in the management of such acute infections, but they may encounter patients seeking dental treatment who are either from, or who have recently toured the endemic disease areas. This article, therefore, summarizes the main features of the Ebola virus infection and its implications in dentistry.*

**Key words:** Ebola virus infection, Infectious diseases, dental health professionals

## INTRODUCTION

“Emerging infectious diseases” is not a new concept. Many new epidemics have been documented by ancient Greek, Roman and Persian writers.<sup>1,2</sup> AIDS which is caused by human immunodeficiency virus have great impact on dentistry. Currently, we have a severe epidemic of Ebola virus infection caused by Zaire ebolavirus species. So, our dental professionals should be cautious regarding the deleterious effects of ebola.

**Ebola virus disease (EVD)** is a rare and deadly disease caused by infection with one of the Ebola virus strains. Ebola can cause disease in humans and nonhuman primates (monkeys, gorillas, and chimpanzees). Ebola epidemic in 2014 is the largest in history, affecting mainly West Africa and recently a case was reported in India.

**Signs and symptoms** typically start between two days and three weeks after contracting the virus. Symptoms noted are fever, sore throat, muscle pain, and headaches followed by vomiting, diarrhea and rashes. Liver and kidney functions are also impaired. Internal and/or external bleeding is also reported. A person infected with Ebola becomes contagious only when symptoms appear. The incubation period of EVD varies from 2 to 21 days. Acute gingival bleeding is the oral manifestation reported in EVD infections.<sup>3,4</sup>

## Transmission of the virus

According to World Health Organization reports, Transmission of ebola virus happens through close contact with the blood, secretions, organs or other bodily fluids of infected animals. Human-to-human transmission is through direct contact with the

blood, secretions, organs or other bodily fluids, such as saliva, of infected people especially when there is ulcer or break in skin or mucous membranes. Reports indicate that semen can transmit the virus even after the recovery from the disease for up to two months.<sup>4,5</sup>

## Laboratory Findings:

Early recognition with rapid and accurate diagnosis of Ebola infection is important for the initiation, continuation, and cessation of appropriate isolation protocols. Laboratory findings can support the diagnosis of Ebola viral disease but are not specific. Low calcium level (<6 mg/dL) is reported to be a predictor of poor prognosis. Malaria testing should also be performed, which requires thick and thin blood smears. As an alternative, there is a rapid antigen test, which can provide results in 2 to 25 minutes.<sup>2-3</sup>

There are several laboratory techniques developed for diagnosis of Ebola viral disease: Enzyme-linked immunosorbent assay testing that detects viral antigenemia, Enzyme-linked immunosorbent assay testing for viral antibodies (Immunoglobulin M and Immunoglobulin G), reverse transcriptase polymerase chain reaction (RT-PCR) assay that detects viral ribonucleic acid, virus isolation by cell culture and immunohistochemistry staining. The latter two tests have limiting clinical relevance for early diagnosis as these tests can be performed only on deceased patients.

RT-PCR is currently the main method for rapid and accurate diagnosis of Ebola viral disease. RT-PCR offers an important advantage over the other techniques during an epidemic because it can detect viral ribonucleic acid early in infection, whereas IgG

and IgM appear later. Ebola virus may be detected in the blood by RT-PCR approximately 10 days after symptoms appear. Current guidelines specify that a minimum of 4 mL whole blood be collected in plastic tube containing ethylenediaminetetraacetic acid (EDTA) and be stored and transported frozen on cold packs for testing by RT-PCR assay.<sup>6</sup>

### Concern for Dental care providers

Dental professionals are not directly involved in the management of such acute infections but they may encounter patients seeking dental care who are either from, or who have recently toured the endemic disease areas.<sup>3</sup> So, Dental care providers should be educated whether or not to treat such patients and if treatment has to be given, under what protocol. Dentists will have to perform the general physical examination to check prodromal signs and symptoms. Any person if returned within 21 days from the West African countries like Liberia, Sierra Leone and Guinea where epidemic of this disease has been seen may be at risk of having contacted persons infected with Ebola. In such cases, dental professionals are advised to delay routine dental care of the patient until 21 days have elapsed from their trip. Emergency dental treatment for dental infections and pain can be provided after consulting with the patient's physician and conforming to standard precautions and physical barriers.<sup>5,7</sup>

Till date, no single case of transmission of EVD has been reported. As the virus can be transmitted through saliva so dental care workers in the endemic areas of the virus, may run the risk of acquiring the disease if strict standard infection control measures are not routinely followed.<sup>3,5,7</sup>

Dental health professionals are constantly exposed to these emerging and re-emerging infectious threats and ignorance can be dangerous. Surveillance and good clinical practice with standard infection control at all times are fundamental to prevention, as you never know when new diseases came your way. In spite of making spectacular technical and scientific advances still human beings are defenseless in front of these microbes. Hence, dental professionals are advised to take a medical history, including a travel history from any person with symptoms in which a viral infection is suspected. If Ebola is suspected, dental professionals should strictly follow CDC guidelines<sup>8,9</sup> including physical barrier techniques for infection control so that they can prevent themselves and other population from being infected with such deadly disease and contact their state or local health department if they encounter such cases.

### CONCLUSION

It is clear that health-care providers, family, and friends in close contact with EVD patients are at

the highest risk for acquiring the disease. During outbreaks of Ebola, the disease can spread quickly within health-care settings. So, the basic things that we all know about personal protective equipment need to be adhered to strictly. Infection control standards must be followed strictly because virus transmission through cross contamination can do more harm and will spread the disease. Hence, dentists should be alert and they must review each and every patient thoroughly.

### REFERENCES

1. T.Dikid, S.K. Jain, A. Sharma, A. Kumar, and J.P. Narain. Emerging & re-emerging infections in India: An overview. *Indian J Med Res.* Jul 2013; 138(1): 19–31.
2. Jezek Z. Ebola fever: an emerging disease. *Epidemiol Mikrobiol Imunol.* 2001 Apr;50(2):54–66.
3. Samaranayake LP, Peiris JS, Scully C. Ebola virus infection: an overview. *Br Dent J.* 1996 Apr 6;180(7):264–6.
4. Samaranayake L, Scully C, Nair RG, Petti S. Viral Haemorrhagic Fevers with Emphasis on Ebola Virus Disease and Oro-dental Healthcare. *Oral Dis.* 2014 Nov 14.
5. Chowell G, Nishiura H. Transmission dynamics and control of Ebola virus disease (EVD): a review. *BMC Med.* 2014 Oct 10;12(1):196.
6. Fajfr M, Neubauerova V, Pajer P, Kubickova P, Ruzek D. Detection panel for identification of twelve hemorrhagic viruses using real-time RT-PCR. *Epidemiol Mikrobiol Imunol.* 2014 Fall;63(3):238–244.
7. Interim manual - Ebola and Marburg virus disease epidemics: preparedness, alert, control, and evaluation World Health Organization, Geneva, 2014.
8. Interim Infection Prevention and Control Guidance for Care of Patients with Suspected or Confirmed Filovirus Haemorrhagic Fever in Health-Care Settings, with Focus on Ebola, World Health Organization, September, 2014.
9. Information for Healthcare Workers and Settings. Centers for Disease control and Prevention.
10. Guidance on Personal Protective Equipment To Be Used by Healthcare Workers During Management of Patients with Ebola Virus Disease in U.S. Hospitals, Including Procedures for Putting On (Donning) and Removing (Doffing). Centers for Disease control and Prevention. Oct 20, 2014.
11. Visser LG, Schippers EF, Swaan CM, van den Broek PJ. How to treat a patient with indications for an infectious viral hemorrhagic fever. *Ned Tijdschr Geneesk.* 2002 Nov 16;146(46):2183–8.