

Hantavirus And Dental Practice: Strengthening Awareness Against Emerging Zoonotic Threats

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Abstract

Hantaviruses are emerging zoonotic pathogens transmitted by rodents that can lead to potentially fatal illnesses in humans, such as Hantavirus cardiopulmonary syndrome (HCPS) and haemorrhagic fever with renal syndrome (HFRS). While there is no specific antiviral treatment available, early supportive care can significantly improve survival outcomes. Prevention is largely focused on minimizing human exposure to infected rodents and contaminated environments. Although healthcare-associated transmission is rare, dental professionals should remain cautious, as dental procedures can create aerosols and involve close contact with saliva, blood, and respiratory secretions. Strengthening awareness, infection control measures, and preparedness in dental practices is essential to reduce potential occupational risks and effectively respond to emerging zoonotic threats.

Keywords: Airborne Viruses, Anti-Viruses Vaccine, Dental Cross Infection, Rodents, Zoonotic Disease

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I. Introductions:

In recent years, the repeated outbreaks of Hantavirus disease have become a notable concern for human health. While Hantavirus infections are relatively rare globally, they carry a case fatality rate of less than 1% to 15% in Asia and Europe and can be as high as 50% in the Americas. It is estimated that worldwide, there are between 10,000 and over 100,000 infections annually. [1]

Hantaviruses belong to the Hantaviridae family in the Bunyavirales order and are enveloped single-stranded negative-sense RNA viruses. They are mainly transmitted by rodents through their urine, feces, and saliva, as well as through aerosols generated from these materials. So far, human-to-human transmission has only been confirmed in the Americas and is still uncommon. When it happens, it is usually associated with close and prolonged contact. [2]

The incubation period for Hantaviruses has been estimated to be 1–6 weeks and it is the causative agent of two acute febrile illnesses in humans: haemorrhagic fever with renal syndrome (HFRS) and Hantavirus pulmonary syndrome (HPS). Both conditions are characterized by initial acute thrombocytopenia and alterations in vascular permeability. [3] Dentistry is a profession that treats patients with teeth, and the oral cavity is a vacuum for many blood-borne, airborne, and waterborne diseases. Oral manifestations of many systemic diseases enable dental professionals to play a pivotal role in diagnosis by early detection of signs and symptoms. This commentary aims to strengthen awareness regarding emerging zoonotic threats within dental practice and to discuss the occupational risks associated with aerosol-generating dental procedures, and the importance of infection prevention and control measures in protecting both patients and dental healthcare workers.

Clinical features of Hantavirus Infection:

Clinical manifestation of hantavirus infection usually appears within 1–8 weeks after exposure and initially present with non-specific flu-like symptoms, including fever, fatigue, headache, myalgia, nausea, and gastrointestinal disturbances. [4] As the disease progresses, patients may develop either Hantavirus, Firstly

Hantavirus Pulmonary Syndrome (HPS), characterized by cough, dyspnoea, chest tightness, and rapid respiratory failure, Secondary Haemorrhagic Fever with Renal Syndrome (HFRS), which presents with hypotension, haemorrhagic manifestations, and acute kidney injury. Disease severity ranges from mild illness to severe life-threatening complications depending on the Hantavirus strain. [2]

Oral manifestations of Hantavirus Infection:

Dental professionals should be mindful that unexplained oral bleeding or petechiae on the skin and mucosa, particularly when linked with fever, ecchymoses, conjunctival bleeding, and epistaxis, occur in roughly one-third of patients and may warrant immediate medical referral. [5] Various published reports discuss haemorrhagic disorders that feature oral symptoms, including mucosal haemorrhage, dry mouth, oropharyngeal erythema, and oral ulcerative lesions. These findings support the potential oral presentation associated with Hantavirus-related thrombocytopenia. [6]

Diagnosis

Early diagnosis of hantavirus infection is challenging due to its nonspecific symptoms, which may mimic other febrile or respiratory illnesses such as influenza, COVID-19, and leptospirosis.[2] Therefore, detailed clinical history, including potential rodent exposure, environmental risks, and travel history, is essential. Laboratory confirmation is based on serological detection of Hantavirus-specific IgM antibodies or rising IgG titres, while RT-PCR may detect viral RNA during the acute phase. As patient specimens may pose a biohazard risk, non-inactivated samples should be handled under appropriate biosafety conditions and transported using the triple packaging system. [2]

Treatment of Hantavirus Diseases:

Up to date according to many studies no licenced specific antiviral treatment or vaccine for Hantavirus infection. Only supportive treatment includes early intensive care, including oxygen therapy, mechanical ventilation, and careful fluid management, is essential to improve outcomes, especially in severe cases of Hantavirus pulmonary syndrome (HPS). [2] In cases of severe cardiopulmonary failure, extracorporeal membrane oxygenation (ECMO) may be required. Patients with haemorrhagic fever with renal syndrome (HFRS) may also need dialysis for acute kidney injury. Ribavirin has shown limited benefit in some HFRS cases, while other antivirals remain experimental. [7]

Oral Health Care Preparedness and Infection Control Measures:

Oral health care professionals often perform aerosol-generating procedures and are in close contact with saliva, blood, and respiratory secretions, making it important to stay vigilant. Therefore, dental clinics should enhance their preparedness strategies for this emerging virus. [2]

In dental practice, it's crucial to begin with early patient screening and triage. Utilizing N95 respirators, face shields, protective eyewear, high-volume suction, and proper ventilation systems is also important to help reduce the risks of airborne transmission. [8] Dental facilities should uphold rigorous environmental cleaning protocols, guarantee safe waste disposal, and close any openings that might allow rodent entry. Regular education and training for dental professionals will boost adherence to infection prevention practices and minimize occupational exposure risks. [8]

Vaccination:

There is no universally licensed vaccine for Hantavirus. However, inactivated vaccines are approved for human use such as Hantavax Developed in South Korea and Bivalent Inactivated Vaccines: Widely used in China, protects against both Hantavirus and Seoul virus. [9] As of 2026, there are no approved Hantavirus vaccines available in the United States, Europe, or Latin America, but DNA vaccine trials are being conducted in the United States. The Progress on a universal Hantavirus vaccine has been gradual, primarily due to the variety of viral strains detected along with the unpredictable occurrence of outbreaks. [10]

Recommendation to prevent spread of the Hantaviruses diseases:

- Enhancing standard infection control measures, surface disinfection, and sterilization of dental instruments.
- Implementation of early screening and triage systems prior to elective dental treatments.
- Increasing awareness and training for oral healthcare workers.
- Improving clinic ventilation and environmental hygiene.
- Promoting effective rodent control measures.
- Proper management of suspected cases and postpone any non-urgent treatments.

II. Conclusion:

Oral Manifestations are uncommon, yet dental professionals should be aware of the hemorrhagic oral signs and risks of transmission of Hantavirus Infection in the clinical Settings. Further Studies are needed to clarify the oral health implications and preparedness strategies related to hantavirus infection.

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Author Contribution:

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Elhadi Mohieldin Awooda : revised the manuscript, and copyediting.

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