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Letter to Editor

Is Hantavirus Closer Than We Think? A Renewed Global Warning

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Dear Editor

In an era marked by the accelerating emergence of zoonotic pathogens, hantaviruses remain a paradoxical threat well documented, yet persistently underestimated in global preparedness frameworks. According to the recent World Health Organization (WHO) fact sheet, hantaviruses are rodent-borne zoonotic viruses that cause two main clinical syndromes: hemorrhagic fever with renal syndrome (HFRS) in Europe and Asia, and hantavirus cardiopulmonary syndrome (HCPS) in the Americas. WHO also notes that HCPS may have a case fatality rate of up to 50%, and that there is no specific curative treatment or widely available vaccine, with management relying on early supportive care and monitoring for respiratory, cardiovascular, and renal complications [1].

Globally, hantavirus infections are estimated to range from 10,000 to more than 100,000 cases annually, with the largest burden reported in Asia and Europe [1]. Although the Americas report comparatively fewer cases, HCPS remains particularly concerning due to its high mortality and rapid clinical deterioration. These epidemiological realities challenge the perception of hantavirus as a rare or geographically limited pathogen. Instead, they suggest a persistent zoonotic reservoir capable of causing severe disease whenever ecological and behavioral conditions align.

A central concern is the increasing ecological instability shaping host–pathogen dynamics. Hantaviruses are maintained in specific rodent reservoirs, and transmission to humans typically occurs through inhalation of aerosolized virus particles from contaminated urine, droppings, or saliva [1-3]. Environmental disturbances, including climate variability, deforestation, agricultural expansion, and urban encroachment can significantly alter rodent population density and distribution, thereby increasing opportunities for spillover events [4]. Historical analyses of outbreaks have repeatedly demonstrated

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correlations between climatic anomalies, such as El Niño events, and surges in rodent populations followed by increased human infection [5].

Another factor elevating concern is the potential complexity of transmission dynamics. While most hantaviruses are transmitted exclusively from rodents to humans, the Andes virus (ANDV) in South America is the strain with documented human-to-human transmission, predominantly in close-contact settings [1, 6, 7]. Although such transmission remains rare, it illustrates that hantavirus epidemiology may be more flexible than traditionally assumed. In a globalized world characterized by rapid mobility and ecological disruption, even limited human transmissibility warrants careful surveillance.

Clinical recognition of hantavirus infection also presents significant challenges. Early symptoms, including fever, headache, myalgia, and gastrointestinal complaints are nonspecific and overlap with numerous infectious diseases such as influenza, dengue, leptospirosis, COVID19, and other viral pneumonias [1, 6]. Consequently, cases may be misdiagnosed or overlooked, particularly in regions where laboratory capacity for molecular or serologic testing remains limited. Delayed diagnosis is especially problematic given the rapid progression of HCPS, where respiratory failure and shock may develop within a short period after symptom onset.

Despite these concerns, therapeutic and preventive options remain limited. WHO emphasizes that no specific curative treatment exists for hantavirus disease and that management relies largely on early supportive care and careful monitoring of respiratory, cardiovascular, and renal complications [1]. Several experimental vaccine strategies are currently under investigation, including inactivated vaccines, recombinant protein vaccines, viral-vector vaccines, and DNA-based vaccines targeting hantavirus glycoproteins [1]. Although inactivated vaccines have been used in China and South Korea against HFRS, no universally approved or widely available vaccine currently exists, and vaccine development remains an active area of research [1, 8]. Treatment of hantavirus infection is mainly supportive and includes early intensive care, careful fluid management, respiratory support, and hemodynamic monitoring [1]. In severe cases of HCPS, mechanical ventilation or extracorporeal membrane oxygenation (ECMO) may be required, while patients with HFRS may need renal replacement therapy such as dialysis [1]. The absence of widely available vaccines and targeted antivirals further underscores the importance of prevention through rodent control, environmental hygiene, and occupational risk mitigation.

Taken together, these factors suggest that hantavirus should not be regarded as a static or regionally confined zoonosis. Instead, it represents a dynamic ecological pathogen whose risk profile may evolve alongside environmental and societal change. Strengthening surveillance systems, integrating ecological monitoring with public health reporting, and expanding diagnostic awareness among clinicians are critical steps to mitigate future outbreaks.

The lesson repeatedly reinforced by emerging infectious diseases is that pathogens circulating quietly within animal reservoirs can rapidly become significant public health threats under the right conditions. Hantaviruses already possess the biological capacity to cause severe disease, documented spillover, and, in rare circumstances, human-to-human transmission.

In this context, the question is no longer whether hantaviruses are dangerous, they clearly are. Rather, the more pressing question for global health systems is whether we are recognizing their warning signals early enough.

If ecological disruption continues to reshape human–wildlife interfaces, hantavirus may be closer than we think.

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