

## Introduction

Hemorrhagic fever with renal failure D (HFRD) occurs mainly in Europe and Asia and characterized by fever and renal failure associated with hemorrhagic manifestations. Hemorrhagic fever with renal failure D is caused by an airborne contact with secretions from rodent hosts infected with the group of viruses belonging to the genus Hantavirus of the family Bunyaviridae. In Europe, hemorrhagic fever with renal failure D caused by 3 hantaviruses: Puumala virus (PUUV), carried by the bank vole (*Myodes glareolus*); Dobrava virus (DOBV), carried by the mouse (*Apodemus flavicollis*); and Saaremaa virus (SAAV), carried by the striped field mouse (*Apodemus agrarius*).

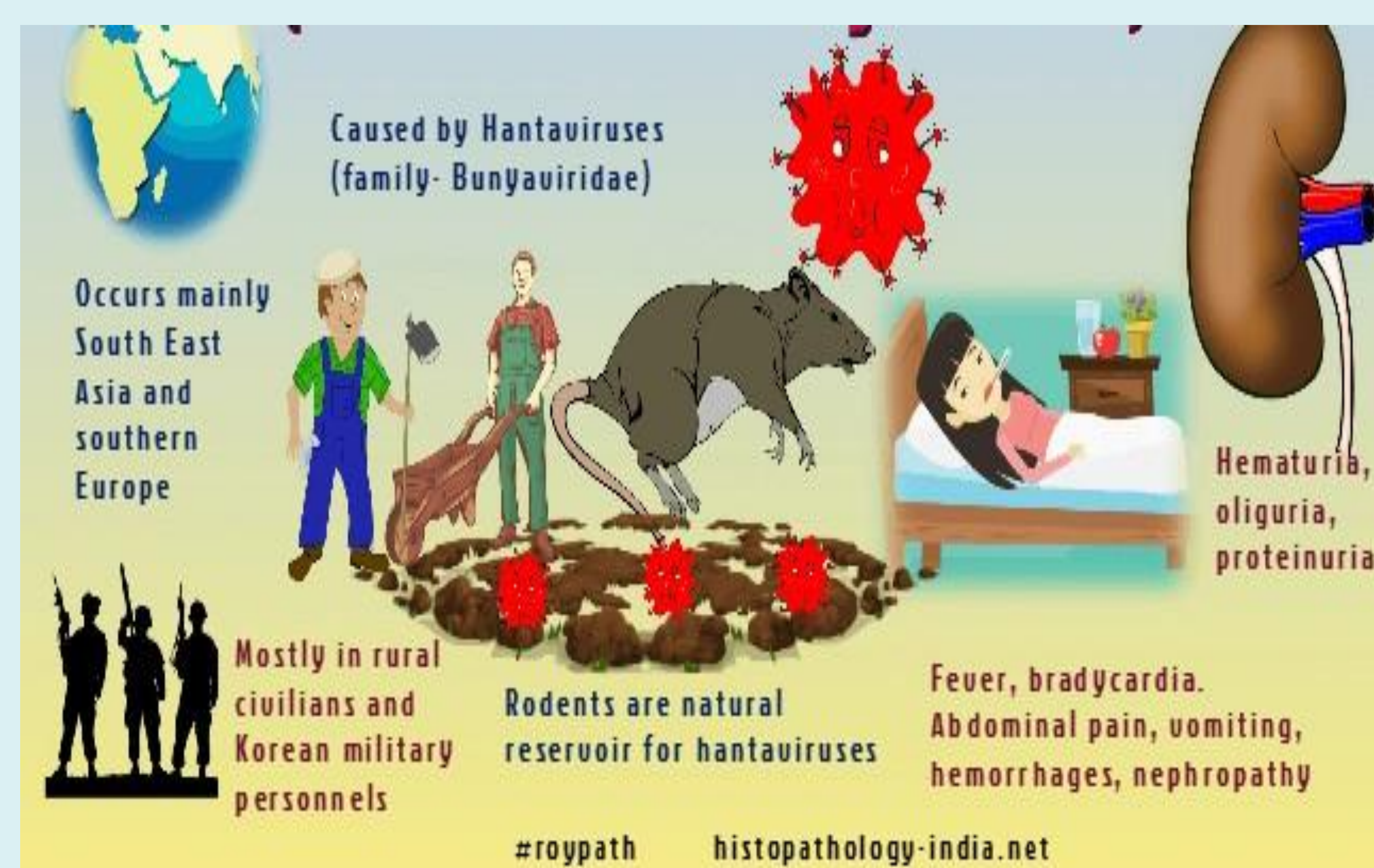


figure1

## Discussion

pathogenesis is largely unknown, but findings from several studies have suggested that immune mechanisms play an important role. After the infection, marked cytokine production, kallikrein-kinin activation, complement pathway activation, or increased levels of circulating immune complexes occur. These components play an important role during the febrile and hypotensive stages. Damage to the vascular endothelium, capillary dilatation, and leakage are clinically significant features of the disease.

Hantaviruses are carried and transmitted by rodents. People can become infected with these viruses and develop HFRS after exposure to aerosolized urine, droppings, or saliva of infected rodents or after exposure to dust from their nests

## Discussion

The clinical features in hemorrhagic fever with renal failure D (HFRD) consist of a triad of fever, hemorrhage, and renal insufficiency. Other common symptoms during the initial phase of the illness include headache, myalgia, abdominal and back pain, nausea, vomiting, and diarrhea. Other symptoms include chills, dizziness, increased thirst, costovertebral tenderness, and flank pain

### Incubation (4-40 days)

#### **1) Febrile Phase (3-5 days) :**

Characterized by fever, chills Headache, severe myalgia (muscle pain), nausea Blurred vision, photophobia, eye pain caused by movement Flushing of face, V-area of the neck and back Petechiae (small red spots on skin) e Abdominal pain and back pain. Thirst, edema, hemoconcentration, postural hypotension

#### **2) Hypotensive Phase (hours to days) :**

Blood pressure decrease, hypovolemia (decreased blood volume), shock Worsening of bleeding manifestations: petechiae, epistaxis (nosebleed), gastrointestinal and intracranial bleeding o Levels of area and creatinine in blood rise, proteinuria (excessive protein in urine) Leukocytosis, thrombocytopenia (decreased # platelets)

#### **3) Oliguric Phase (3-7 days) Recovery:**

Marked by decreased urine production due renal (kidney) dysfunction Hypervolemia (high blood volume) leading to hypertension Blood electrolyte imbalance Continuation of hemorrhagic symptoms Severe complications: cardiac failure pulmonary edema (swelling of lungs), and cerebral bleeding

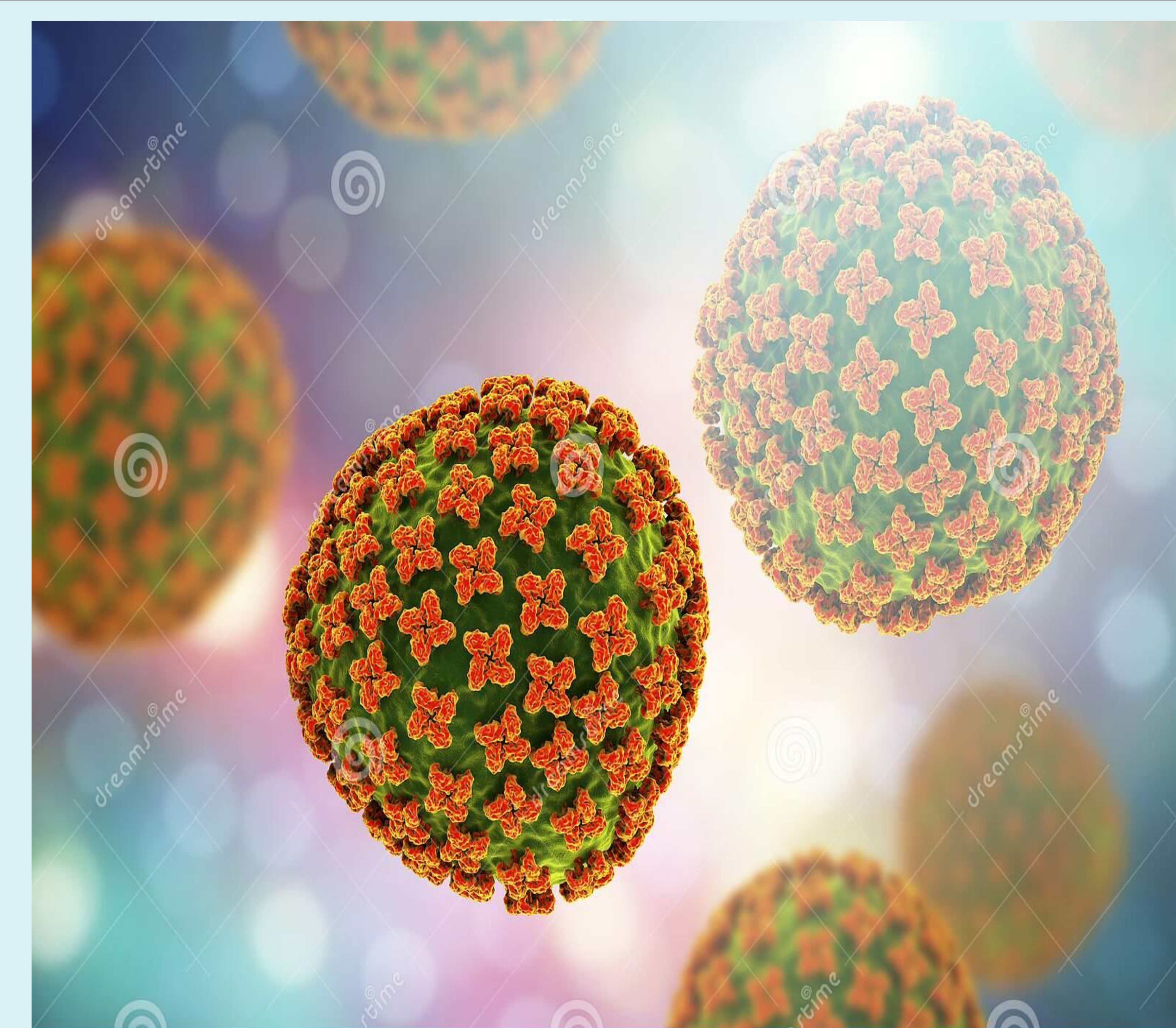
#### **4) Diuretic Phase (2-21 days)**

Beginning of recovery 3-6 liters of urine/ day; return to normal renal activity o Anorexia, fatigue due to dehydration

#### **5) Convalescent Phase (2-3 months)**

Progressive improvement in glomerular filtration, renal blood flow, and urine concentrating ability

Supportive therapy is the mainstay of care for patients with hantavirus infections. Care includes careful management of the patient's fluid (hydration) and electrolyte (e.g., sodium, potassium, chloride) levels, maintenance of correct oxygen and blood pressure levels, and appropriate treatment of any secondary infections. Dialysis may be required to correct severe fluid overload. Intravenous ribavirin, an antiviral drug, has been shown to decrease illness and death associated with HFRS if used very early in the disease. Depending upon which virus is causing the HFRD, death occurs in less than 1% to as many as 15% of patients. Fatality ranges from 5-15% for HFRS caused by Hantaan virus, and it is less than 1% for disease caused by Puumala virus.



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Figure2: Hanta virus

## Conclusion

Hantavirus infection and HFRS should be suspected in patients with symptoms of acute renal failure, fever, haemorrhage, headache, and abdominal/back/orbit pain, who live in rural areas or who have had possible rodent exposure within the 7 weeks

## References

1. CDC - hemorrhagic fever with renal syndrome (HFRS) - hantavirus [Internet]. Centers for Disease Control and Prevention. Centers for Disease Control and Prevention; 2017 [cited 2022Jan8]. Available from: [https://www.cdc.gov/hantavirus/hfrs/index.html#:~:text=Hemorrhagic%20fever%20with%20renal%20syndrome%20\(HFRS\)%20is%20a%20group%20of%20hemorrhagic%20fever%2C%20and%20nephropathia%20epidemic](https://www.cdc.gov/hantavirus/hfrs/index.html#:~:text=Hemorrhagic%20fever%20with%20renal%20syndrome%20(HFRS)%20is%20a%20group%20of%20hemorrhagic%20fever%2C%20and%20nephropathia%20epidemic).
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