Hantavirüs Enfeksiyonları:

Ateş, Trombositopeni ve Akut Böbrek Hasarında Ne Zaman Düşünelim?

Sinan ÇETİN
Giresun Üniversitesi Tıp Fakültesi
Enfeksiyon Hastalıkları ve Klinik Mikrobiyoloji



EKMUD
TÜRKİYE ENFEKSİYON HASTALIKLARI VE KLİNİK MİKROBİYOLOJİ UZMANLIK DERNEĞİ

Sunum Planı

Vaka sunumu

Mikrobiyoloji

Tarihçe

Epidemiyoloji

Klinik

Tanı - Ayırıcı tanı

Tedavi

Sonuç

Vaka

Eylül 2023

49 yaş E

Ek hastalık yok

10 gündür olan

- Ateş
- Baş ağrısı
- Myalji
- Halsizlik
- İştahsızlık
- Karın ağrısı

Laboratuvar

- **WBC: 31990 /µL**
- Neu: 19350 /µL
- Ly: 7520 /µL
- **PLT: 24000 /µL**
- ALT: 16 U/L
- **AST: 55 U/L**
- **LDH: 596 U/L**
- **CK: 252 U/L**
- T.bilirubin: 0.28 mg/dL
- D.bilirubin: 0.13 mg/dL
- **Üre: 133 mg/dL**
- **Kreatinin: 2.55 mg/dL**
- **CRP: 42 mg/L**
- **Prokalsitonin: 3.15 ng/mL**
- **Laktat: 4.1 mmol/L**
- **Hematüri**
- **Proteinüri**

FM

- **Ateş: 38.1^{O}C**
- Nabız: 110/dk
- TA: 100/65 mmHg
- SS: 20/dk
- SpO2: 94
- Ek patoloji yok


Giresun’da kırsal kesimde yaşıyor
Evinin altındaki odunlukta fare gördüğünü söylüyor

Vaka

Leptospira M

Seftriakson t

3. gün üre:228 mg/dL, kreatinin: 6.48 mg/dL üremiye sekonder? şiddetli bulantı-kusma ve oligüri gelişti, HD uygulandı (topla

7. gün Leptospi

13. gün hastad

47. gün poliüri d rası hipotansif seyre

Scand J Infect Dis. 2009;41(1):57-62. doi: 10.1080/00365540802502629.

More than half of the patients with acute Puumala hantavirus infection have abnormal cardiac findings

Satu Makela [1], Liisa Kokkonen, Ilpo Ala-Houhala, Kaj Groundstroem, Aimo Harmoinen, Heini Huhtala, Mikko Hurme, Antti Paakkala, Ilkka Porsti, Vesa Virtanen, Antti Vaheri, Jukka Mustonen

Circulation. 2014 Mar 25;129(12):1295-302. doi: 10.1161/CIRCULATIONAHA.113.001870. Epub 2014 Jan 7.

Increased risk of acute myocardial infarction and stroke during hemorrhagic fever with renal syndrome: a self-controlled case series study

Anne-Marie Connolly-Andersen [1], Edvin Hammargren, Heather Whitaker, Mats Eliasson, Lars Holmgren, Jonas Klingström, Clas Ahlm

Mikrobiyoloji

Elliovirales takımı (eskiden *Bunyavirales*),

Hantaviridae ailesi,

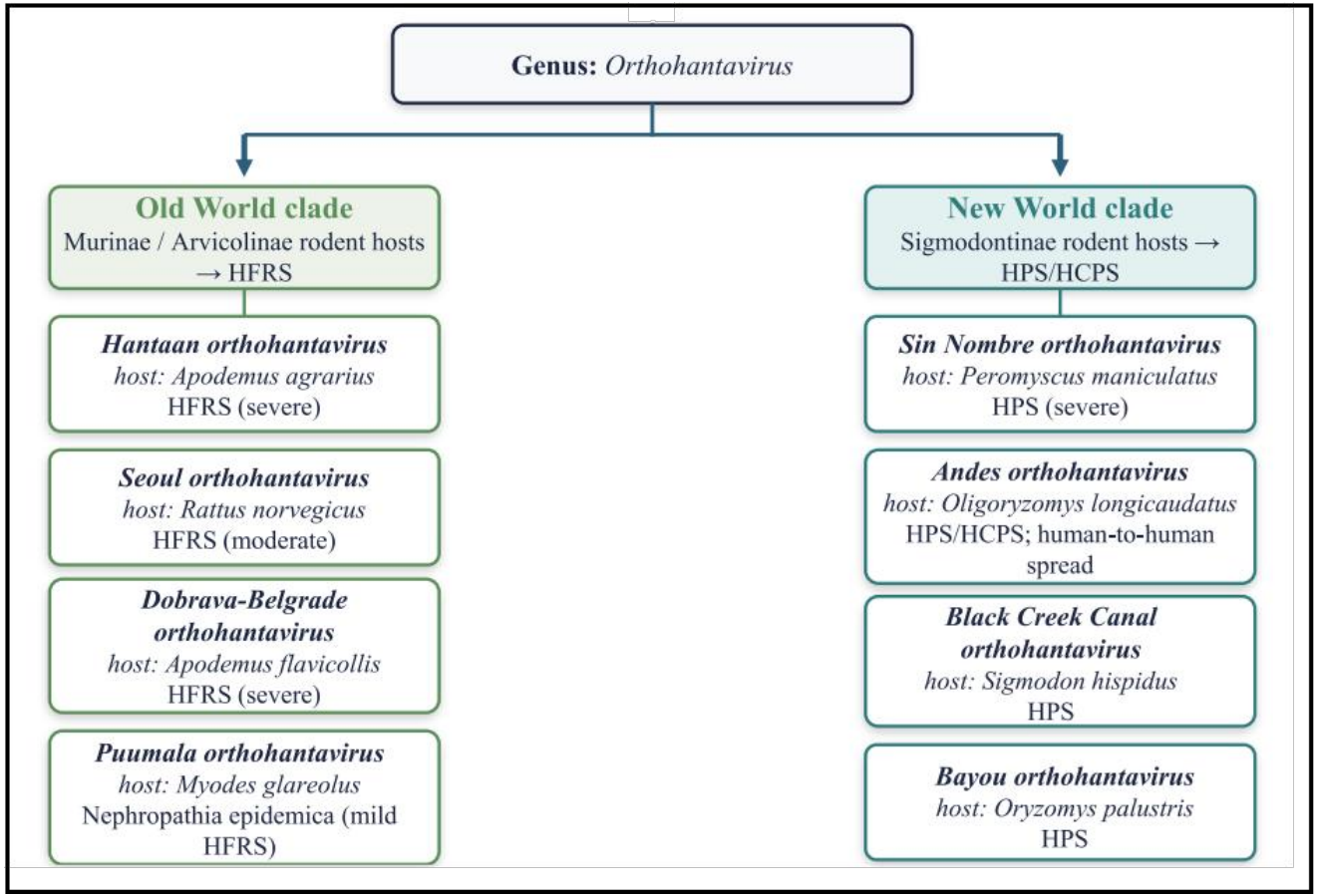
Orthohantavirus genusu

Hantavirus pulmoner sendrom

Renal sendrom ile seyreden kanamalı ateş

RNA virüsü

İnsanda patojen tür 20’den fazla



Kamran M, et al. Hantavirus: A Comprehensive Narrative Review of Virology, Epidemiology, Pathogenesis, Clinical Manifestations, Diagnostics, and Emerging Therapeutic Strategies. Rev Med Virol. 2026

Tarihçe

1000 yıldan eski Çin yazıtlarında ateş ve renal hasar ile ilişkili sendrom

1950-1953 - Kore Savaşı sırasında askerleri etkileyen ateş, böbrek yetmezliği ve şok ile karakterize salgın ‘Kore Kanamalı Ateşi’

1978 - Kore’de Hantaan nehri civarında kemiricilerden izole edilmesi

(Prof. Dr. Ho Wang Lee)

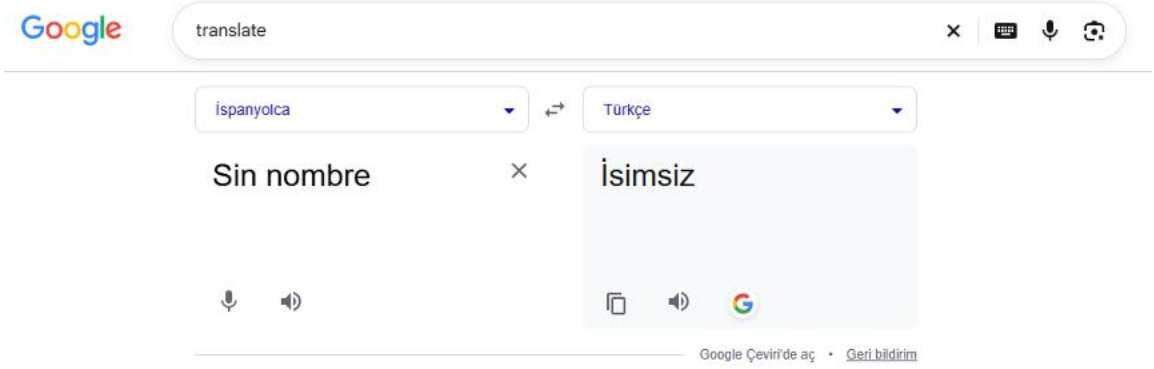
Sonraki yıllarda birçok ülkede farklı tipler izole edildi

1983 - DSÖ ‘Renal sendromla seyreden kanamalı ateş’ isimlendirmesi

1993 - ABD Four Corners bölgesi solunum yetmezliği olguları, hantavirus **Sin nombre virus** izole edilmesi

‘Hantavirus Pulmoner Sendrom’







Salgının çıktığı bölgeye atfen “Four corners virus”

Yetkililer, halk ve turizm sektörü karşı çıkması

İlk tespit edilen Navajo yerlilerinin yaşadığı kanyona atfen “Muerto Canyon Virus”

Navajo yerlileri damgalanmak istemedi, kültürel ve inanç olarak itiraz ettiler

Virüsü izole etmede kullanılan farenin bulunduğu yere atfen “Convict Creek virus”

Benzer sebeplerle itirazlar

Krize dönüşen isimlendirme ironik ve diplomatik olarak

Sin nombre virus ile çözüldü

1995 - Arjantin’de grip benzeri bulgularla başlayıp hızla solunum yetmezliğine ilerleyen vakalar

Andes virus izole edilmesi

1996 - Arjantir kırsal alanda bulunma olma gelişmesi

Genetik dizile

TABLE 1

HPS Cases Compared in This Study

Case	Residence	Relationship and type of contact with previous cases up to 45 days before onset	Date of onset	Date of death
I[a]	El Bolsón	NKC.	9-22-96	9-26-96
A[a]	El Bolsón	Doctor of I.	10-12-96	10-20-96
B[a]	El Bolsón	I's mother.	10-13-96	10-19-96
P	Bariloche	Visiting Bariloche Private Hospital at the same time El Bolson cases were hospitalized.	10-13-96	10-22-96
L	El Bolsón	Housekeeper of I and B.	10-21-96	10-25-96
Q[a]	Bariloche	Spouse of P. Staying at Bariloche Private Hospital giving birth when El Bolson cases were being transferred.	10-22-96	11-2-96
K	El Bolsón	I's friend. Visited him when hospitalized.	10-23-96	
J	Buenos Aires[b]	I's brother-in-law. Stayed at B's home during her funeral. Traveled with L and H in a car.	10-31-96	
H	Buenos Aires[b]	I's sister, spouse of J. Stayed at B's home during her funeral. Traveled with L and J in a car.	11-4-96	
F	El Bolsón	Doctor of I, B, and G: daily contact with A.	11-7-96	
O	Bariloche	Visiting a non-HPS case patient at Bariloche Private Hospital.	11-7-96	11-13-96
N	Bariloche	Bariloche Private Hospital receptionist when El Bolsón cases were hospitalized. Friendly relation with P and Q.	11-8-96	11-17-96
C	El Bolsón	Spouse of A, transferred to Buenos Aires Hospital.	11-8-96	
M	Buenos Aires	J's and H's daughter. Traveled by car with L, J, and H (No history of visiting the area).	11-28-96	
E	Buenos Aires[b]	Friend of C, also a doctor. Took care of her daily at Buenos Aires Hospital.	11-28-96	12-16-96
D	Buenos Aires	Doctor of C at Buenos Aires Hospital.	12-5-96	
AH1[a]	El Bolsón	AH1's father (not included in the study).	4-22-95	4-29-95
ESQ-1/96	Esquel[b]	NKC.	2-9-96	2-14-96
CH-1/96	Chile	NKC.	2-23-96	2-28-96
G	El Bolsón	NKC.	9-23-96	
T	El Bolsón	NKC.	10-4-96	
U (ESQ-2/96)	Esquel	NKC.	11-20-96	11-22-96
SAL-1/96	Orán	NKC.	12-6-97	
ESQ-3/96	Esquel	NKC.	12-19-96	12-24-96
CH-2/96	Chile	NKC.	12-19-96	12-26-96
CH-3/96	Chile	NKC.	1-7-97	1-20-97

Note. NKC, no known contacts with HPS cases. Cases shown in bold letters correspond to Epilink/96.

[a] Living with another HPS case. Housemate case groups: (AH1 and his father); (I, his mother B, and their housekeeper L); (P and his spouse Q), (A and his spouse C); (M and their parents J and H).

[b] Visitors to El Bolsón.

Epidemiyoloji - Dünya

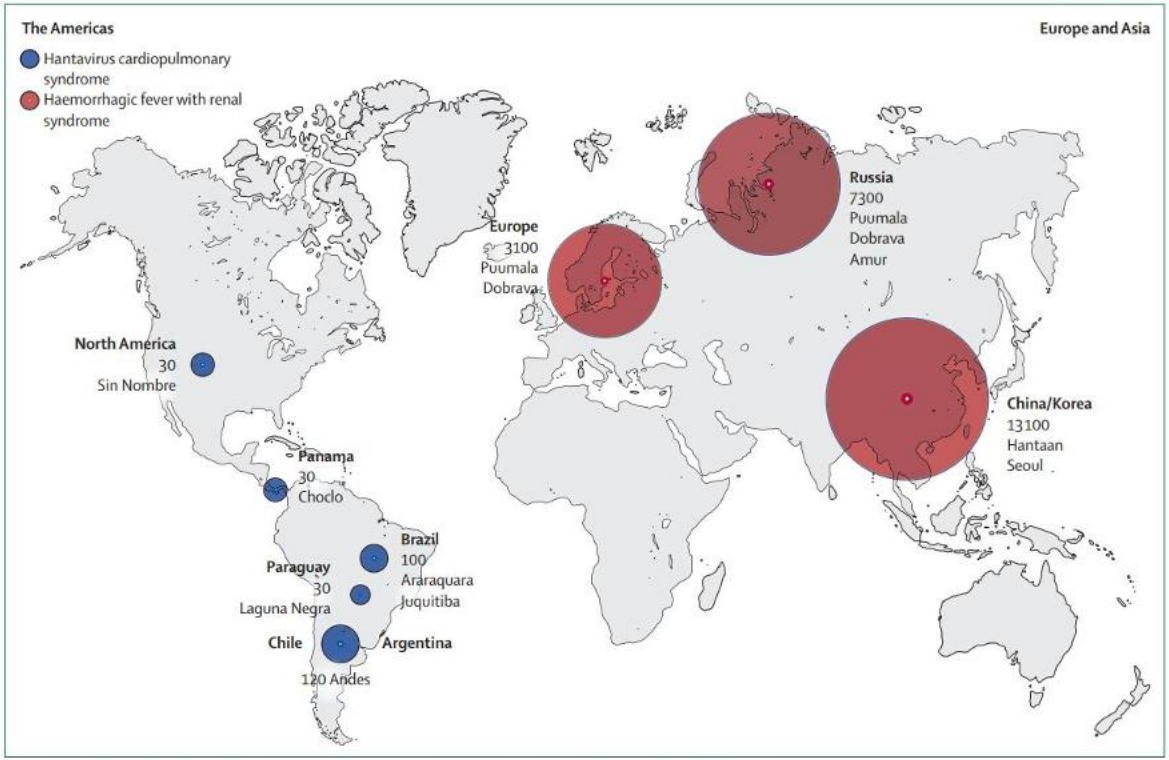
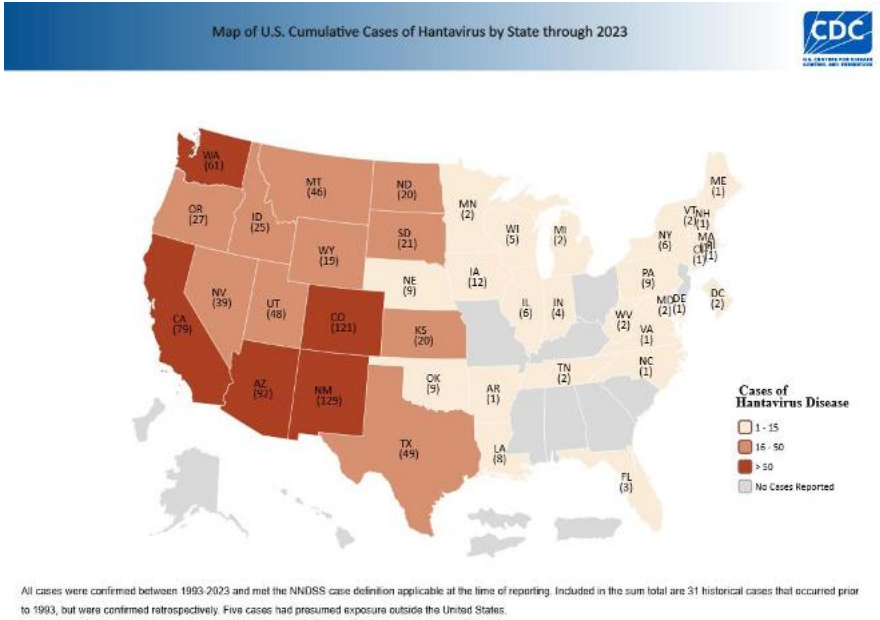
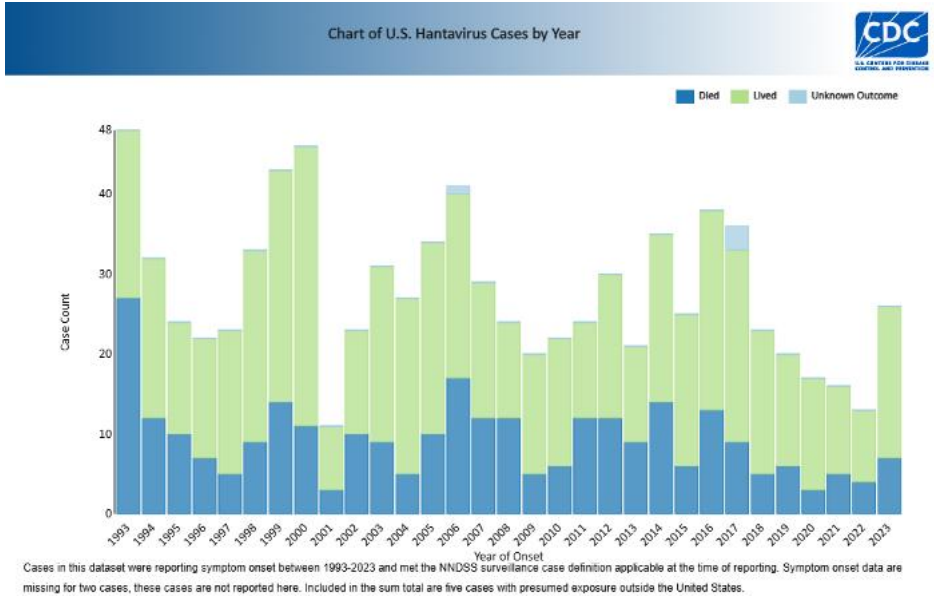


Figure 2: Mean annual number of reported hantavirus cases in different regions and countries (2000–20)

Vial PA, et al. Hantavirus in humans: a review of clinical aspects and management. Lancet Infect Dis. 2023





Yaklaşık 864 olgu, mortalite %35

eCDC
Hantavirus infection - Annual Epidemiological Report for 2023

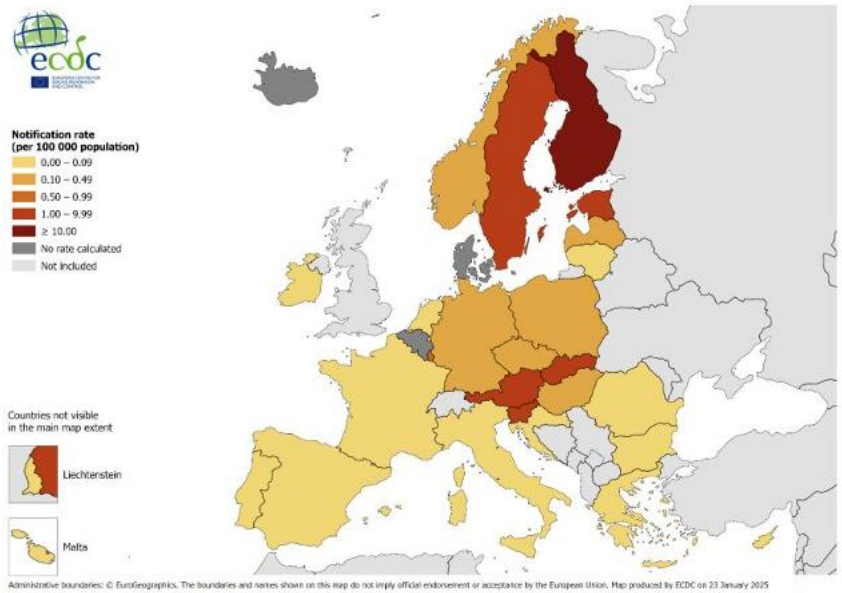
Table 1. Hantavirus infection cases and notification rates per 100 000 population by country and year, EU/EEA, 2019–2023

Country	2019		2020		2021		2022		2023	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Austria	276	3.1	30	0.3	233	2.6	24	0.3	97	1.1
Belgium	94	0.8	45	0.4	81	0.7	80	0.7	99	NRC
Bulgaria	6	0.1	1	0.0	11	0.2	1	0.0	6	0.1
Croatia	191	4.8	17	0.4	7	0.2	6	0.2	2	0.1
Cyprus	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Czechia	15	0.1	5	0.0	8	0.1	7	0.1	11	0.1
Denmark	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC	NDR	NRC
Estonia	26	2.0	17	1.3	12	0.9	13	1.0	19	1.4
Finland	1 256	22.8	1 164	21.1	1 427	25.8	1 299	23.4	806	14.5
France	131	0.2	26	0.0	324	0.5	23	0.0	50	0.1
Germany	1 535	1.8	237	0.3	1 740	2.1	143	0.2	335	0.4
Greece	1	0.0	1	0.0	4	0.0	0	0.0	1	0.0
Hungary	13	0.1	4	0.0	3	0.0	1	0.0	11	0.1
Iceland	0	0.0	0	0.0	0	0.0	0	0.0	NDR	NRC
Ireland	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Italy	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Latvia	5	0.3	3	0.2	3	0.2	3	0.2	4	0.2
Liechtenstein	NDR	NRC	NDR	NRC	0	0.0	0	0.0	0	0.0
Lithuania	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Luxembourg	8	1.3	0	0.0	33	5.2	2	0.3	5	0.8
Malta	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Netherlands	6	0.0	3	0.0	6	0.0	1	0.0	0	0.0
Norway	11	0.2	12	0.2	38	0.7	20	0.4	15	0.3
Poland	9	0.0	3	0.0	42	0.1	5	0.0	43	0.1
Portugal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Romania	4	0.0	1	0.0	12	0.1	7	0.0	6	0.0
Slovakia	94	1.7	49	0.9	117	2.1	84	1.5	154	2.8
Slovenia	252	12.1	14	0.7	569	27.0	7	0.3	64	3.0
Spain	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Sweden	155	1.5	61	0.6	277	2.7	459	4.4	157	1.5
EU/EEA (30 countries)	**4 088**	**0.9**	**1 693**	**0.4**	**4 947**	**1.1**	**2 185**	**0.5**	**1 885**	**0.4**
United Kingdom	3	0.0	NA	NA	NA	NA	NA	NA	NA	NA
EU/EEA (31 countries)	**4 091**	**0.8**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

Source: Country reports. NDR: No data reported. NRC: No rate calculated. NA: Not applicable.

No data from 2020 onwards were reported by the United Kingdom, due to its withdrawal from the EU on 31 January 2020.
For 2023, the rate for Belgium was not calculated as the surveillance system changed so that it was no longer comprehensive.

Figure 1. Distribution of hantavirus infection rates per 100 000 population by country, EU/EEA, 2023



The notification rate for Belgium was not calculated as the surveillance system changed so that it was no longer comprehensive.

MV Hondius Salgını



Tahmin edilen Arjantin’de kuş gözlem aktivitesi sonrası bulaş ve gemide yayılım

11 laboratuvar onaylı, 2 olası toplam 13 vaka

Andes virus

3 ölüm



Nisan 2026 da başlayan süreç

Temmuz 2026 da sonlandı

https://www.who.int/emergencies/disease-outbreak-news/item/2026-DON604

Epidemiyoloji - Türkiye

J Wildl Dis. 2006 Jul;42(3):672-6. doi: 10.7

Serological survey for v rodents

J Laakkonen [1], H Kallio-Kokko, M A Oktem, A Vaheri, H Henttonen

2004 yılında Trabz

Puumala ve Saare

Puumala virüs varl

TABLE 1. Serologic results for rodents tested for rodent-borne viruses in Turkey, April 2004.

Province	Species	LCMV-IFA No. positive/no. examined (% pos)	PUUV/SAAV-IFA No. positive/no. examined (% pos)	CPXV-IFA No. positive/no. examined (% pos)
Trabzon	*Apodemus flavicollis*	0/3	0/3	0/3
	Apodemus mystacinus	0/10	0/10	0/10
	Apodemus sylvaticus s.l.	2/72 (3)	0/72	1/72 (1)
	Microtus roberti	0/4	1/4 (25)	0/4
	Microtus rossiaemeridionalis	1/8 (13)	2/8 (25)	0/8
Rize	*Apodemus flavicollis*	1/28 (4)	0/28	0/28
	Apodemus mystacinus	1/10 (10)	0/10	0/10
	Apodemus sylvaticus s.l.	1/82 (1)	0/82	0/82
	Dryomys nitedula	0/1	0/1	0/1
	Microtus roberti	1/11 (9)	0/11	0/11
	Microtus rossiaemeridionalis	0/7	0/7	0/7
Izmir	*Apodemus mystacinus*	0/7	0/7	0/7
	Apodemus sylvaticus s.l.	1/52 (2)	0/52	0/52
	Microtus guentheri lydius	0/25	1/25 (4)	0/25
	Microtus roberti	0/1	0/1	0/1
	Microtus rossiaemeridionalis	0/9	0/9	0/9
	Total	8/330 (2.4)	4/330 (1.2)	1/330 (0.3)

An outbreak caused by hantavirus in the Black Sea region of Turkey, January – May 2009

M Ertek on behalf of the Refik Saydam National Public Health Agency (mustafa.ertek@saglik.gov.tr)[1], T Buzgan on behalf of the Ministry of Health[2]
1. Refik Saydam National Public Health Agency, Ankara, Turkey
2. Ministry of Health, Ankara, Turkey

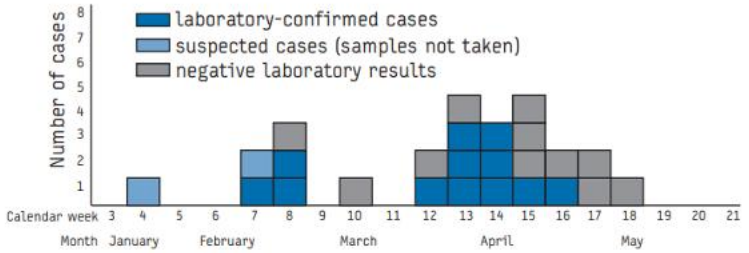
Figure 1

Map of Turkey indicating the area where human cases of hantavirus infection were reported in January - May 2009



Figure 2

Distribution of suspected cases of hantavirus infection reported in Turkey, from January to May 2009, by week of notification



ORIGINAL ARTICLE

WILEY

Zoonoses Public Health. 2019;66:783–797.

Dynamics of Puumala hantavirus outbreak in Black Sea Region, Turkey

Güven Çelebi[1] | Nefise Öztoprak[2] | İbrahim Mehmet Ali Öktem[3] | Paul Heyman[4] | Åke Lundkvist[5] | Maria Wahlström[5] | Fürüzan Köktürk[6] | Nihal Pişkin[1]

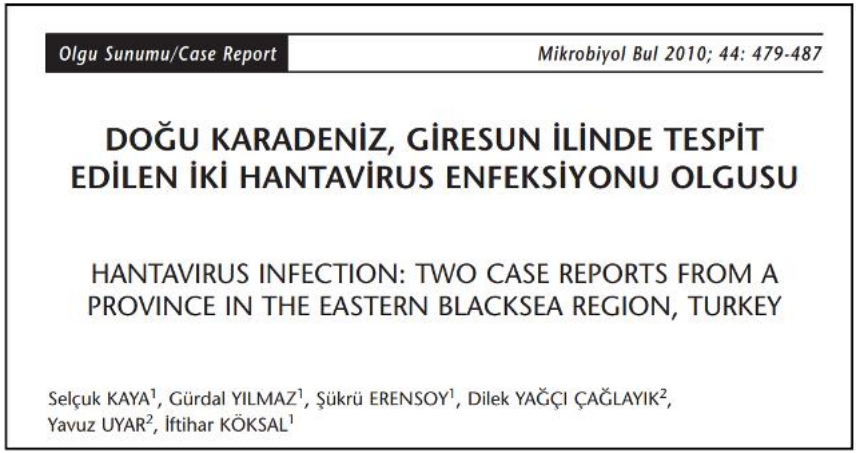
Şubat Ha

PUUV ha

4 olguda

TABLE 5 Variables analysed as potential risk factors for hantavirus transmissions by *binary* logistic regression analysis

Variables	p	OR	95% CI for EXP(B) Lower	Upper
Age	0.743	1.015	0.930	1.107
Sex (male)	**0.019**	**22.372**	**1.659**	**301.682**
Dealing with rodent control activities in the garden or in annexes of the house	**0.021**	**17.113**	**1.534**	**190.843**
Exposure to dust inhalation inside a cellar, attic or woodshed	0.741	0.605	0.031	11.886
Living in a house <500 m from the forest	0.333	3.116	0.312	31.098



Olgu Sunumu/Case Report Mikrobiyol Bul 2010; 44: 479-487

DOĞU KARADENİZ, GİRESUN İLİNDE TESPİT EDİLEN İKİ HANTAVİRUS ENFEKSİYONU OLGUSU

HANTAVIRUS INFECTION: TWO CASE REPORTS FROM A PROVINCE IN THE EASTERN BLACKSEA REGION, TURKEY

Selçuk KAYA[1], Gürdal YILMAZ[1], Şükrü ERENSOY[1], Dilek YAĞÇI ÇAĞLAYIK[2], Yavuz UYAR[2], İftihar KÖKSAL[1]

2009 yılında Giresun ilinde saptanan 2 Hantavirus Dobrava alt tipinde olgu

VECTOR-BORNE AND ZOONOTIC DISEASES
Volume 13, Number 2, 2013
© Mary Ann Liebert, Inc.
DOI: 10.1089/vbz.2011.0939

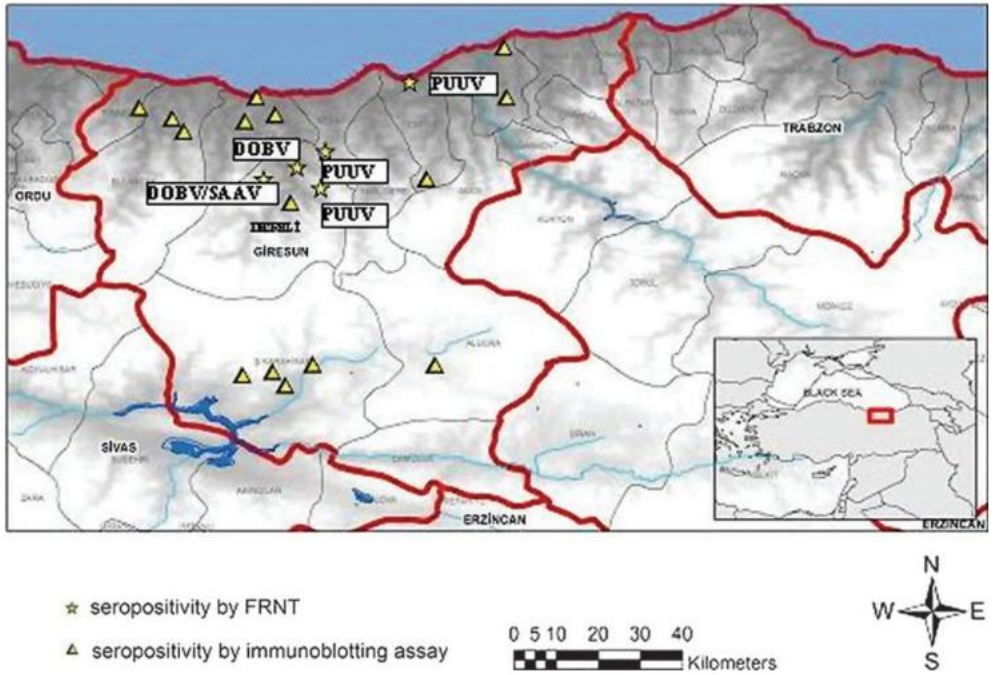
Human Puumala and Dobrava Hantavirus Infections in the Black Sea Region of Turkey: A Cross-Sectional Study

Aysegul Gozalan,[1] Handan Kalay
Vedat Çakir,[3] Cengiz Cinden
Mustafa E

2009 yılında Giresun'

ELISA ile hantav

Bu 65 hastadan 20'sinde im

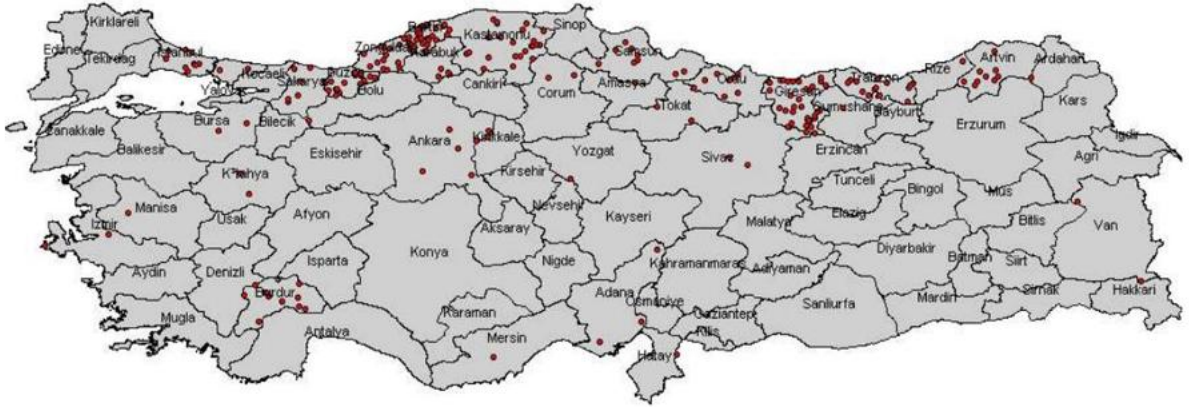


Hantavirüs Enfeksiyonu Vaka ve Ölüm Sayıları, Türkiye, 2009-2024





İllere Göre Vakaların Dağılımı, Türkiye, 2009-2017



Bulaş

Enfekte farelerin tükürük, idrar ve dışkısında virüs bulunur

Enfekte materyalin inhalasyonu

Fare çıkartılarıyla direkt temas

Kemirici tarafından ısırılma (nadiren)

İnsandan insana bulaş (Andes)

Çiftçiler
Orman işçileri
Kampçılar

İnkübasyon

1-7 hafta (ortalama 14-17 gün)



Soru: Neden aynı virüs farklı kıtada farklı hastalık yapar?

- Virüs alt türü farkı
- Reseptör kullanımındaki fark
- Hücresel Tropizm
  - HPS, akciğer epitel ve endoteli ile kalp kası hücrelerine bağlanma yeteneğini de içeren geniş bir tropizm gösterirken,
  - HFRS renal vasküler endotel üzerine sınırlı
- HPS de akciğerdeki immun aracılı hasar daha şiddetli olma eğiliminde

SONUÇ: Endotel disfonksiyonu, kapiller kaçak, immun aktivasyon ortak

Klinik bulgular, hangi vasküler yatağın daha çok etkilendiğine göre değişiyor

Jeyachandran AV, et al. Differential tropisms of old and new world hantaviruses influence virulence and developing host-directed antiviral candidates. PLoS Pathog. 2025

Kamran M, et al. Hantavirus: A Comprehensive Narrative Review of Virology, Epidemiology, Pathogenesis, Clinical Manifestations, Diagnostics, and Emerging Therapeutic Strategies. Rev Med Virol. 2026

Patogenez

Endotel tutulumu

Endotel bariyerinin bozulması

Kapiller geçirgenlik artışı

Kapiller kaçak

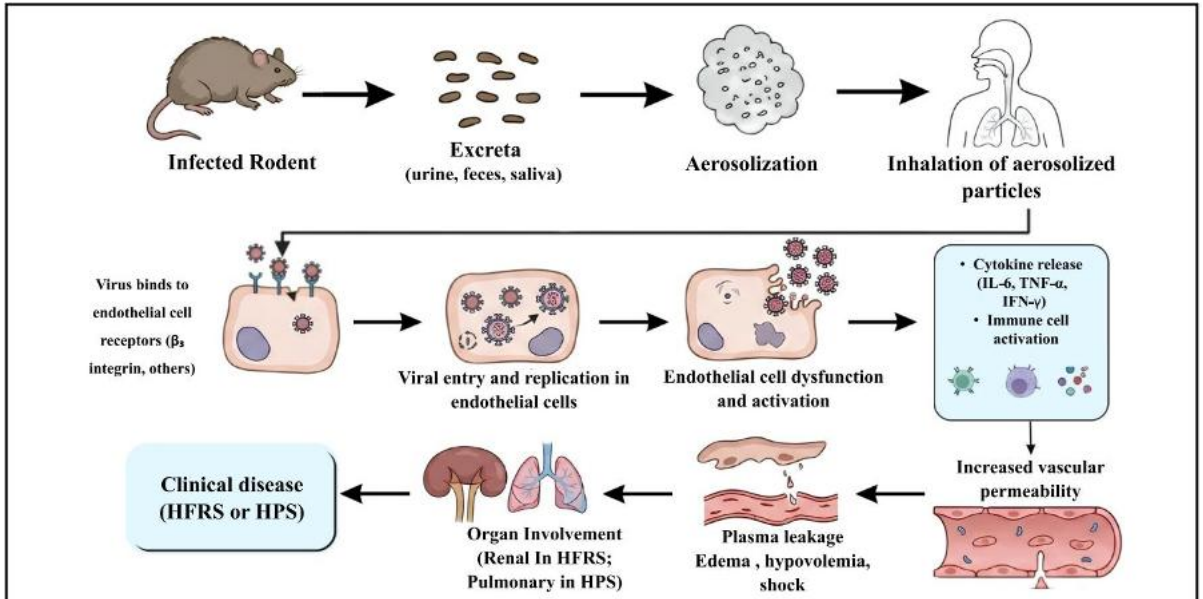


FIGURE 4 | Pathogenesis of hanta virus.

Reviews in Medical Virology, 2026

Patogenez

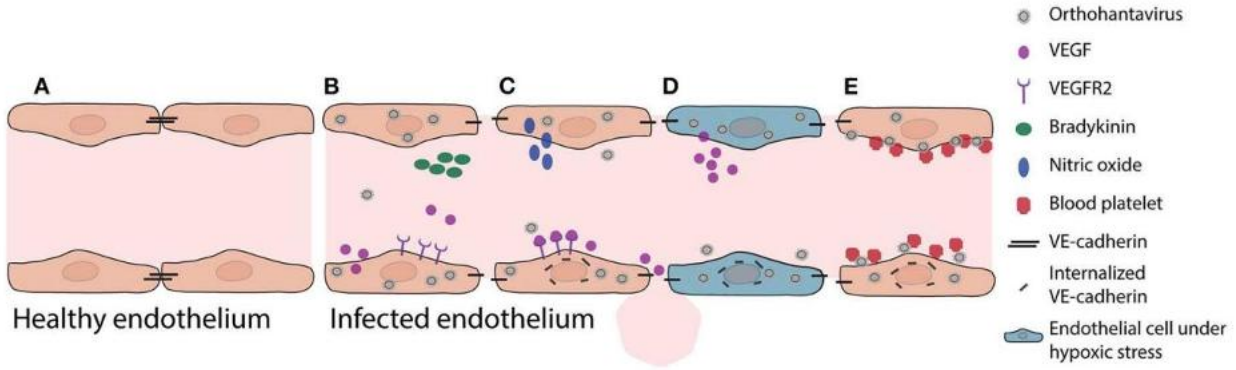


FIGURE 1 | Pathogenic mechanisms in vascular endothelium during initial orthohantavirus infection. **(A)** Healthy vascular ECs contain a tightly regulated barrier, mainly based on adherens junction molecules such as VE-cadherin. **(B)** Important soluble factors that maintain this barrier function are bradykinin and VEGF. As response to infection, ECs produce and secrete VEGF. **(C)** Local VEGF binds to endothelial receptors and disengages adherens junctions by increased nitric oxide production and internalization of VE-cadherin. **(D)** Under hypoxic conditions (for instance due to pulmonary edema), these effects are even expanded as VEGF production is increased, causing increased vascular permeability. **(E)** In addition, orthohantavirus particles present on the endothelial cell surface recruit quiescent platelets to endothelial cell surfaces. This increased consumption of blood platelets may contribute in part to thrombocytopenia. Both the permeabilizing effects of secreted VEGF and the recruitment of platelets lead to internalization of VE-cadherin (i.e., loss of endothelial barrier function).

Noack D, et al. Orthohantavirus Pathogenesis and Cell Tropism. Front Cell Infect Microbiol. 2020

Klinik Bulgular

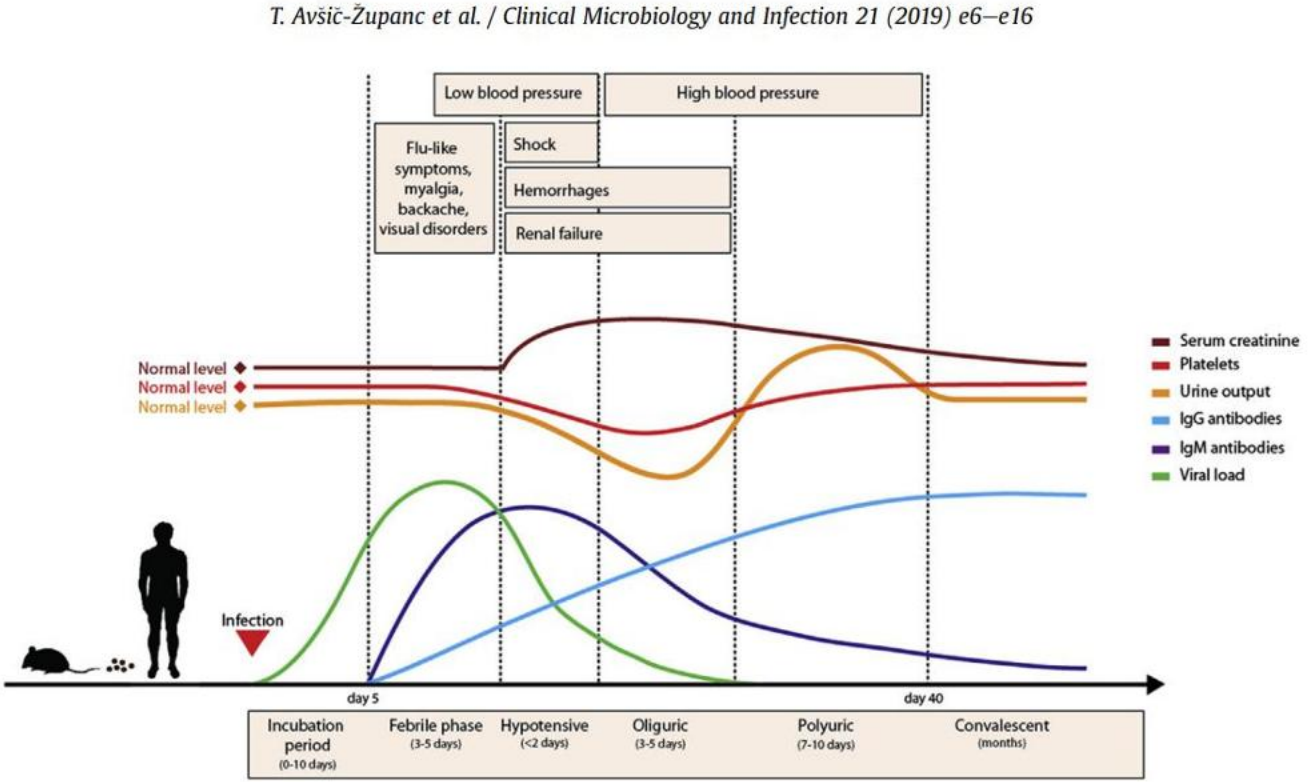
Table 1. General features of HFRS, NE and HCPS

	HFRS	NE	HCPS
Common features	sudden fever, prostration, myalgia and abdominal discomfort		
Symptoms	hemorrhage, petechiae, inflammatory symptoms of the eye, acute myopia, varying degrees of acute renal failure		dry cough, rapidly increasing dyspnea On chest radiography, rapidly evolving bilateral interstitial edema
Clinical phases	five phases (febrile, hypotensive, oliguric, polyuric, convalescent)	five phases (febrile, hypotensive, oliguric, polyuric, convalescent)	three phases (prodromal, cardiopulmonary, convalescent)
Main target organ	kidneys	kidneys	lungs
Morbidity rate	1%–12%	0.1%–1.0%	40%–50%
Complications	acute encephalomyelitis, bleeding, multiorgan dysfunction, pituitary hemorrhage, glomerulonephritis, pulmonary edema, shock, acute respiratory distress syndrome, disseminated intravascular coagulation, lethal outcome	acute encephalomyelitis, bleeding, multiorgan dysfunction, need of dialysis, perimyocarditis, pituitary hemorrhage, pulmonary edema, shock, lethal outcome	renal insufficiency, thrombocytopenia, bleeding, myalgia, headache, nausea, vomiting, diarrhea, shock, lethal outcome

Note: HFRS, hemorrhagic fever with renal syndrome; NE, nephropathia epidemica; HCPS, hantavirus cardiopulmonary syndrome. NE is a mild form of HFRS. (Maes et al., 2009; Papa, 2012; Mustonen et al., 2013; Jiang et al., 2016)

Jiang, H., *et al.* Hantavirus infection: a global zoonotic challenge. *Virol. Sin.* 2017.

Klinik Bulgular - HFRS



Klinik Bulgular - HFRS

Ateş, karın ağrısı, bulantı-kusma, halsizlik, konjonktival hemoraji, baş ağrısı, akut myopi

Hipotansiyon

Akut böbrek hasarı

Çoğu hastada geçici glomeruler filtrasyonda azalma izlenir

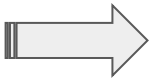
PUUV %5

DOBV - HTNV %20-40

Diyaliz ihtiyacı !

Kreatinin yüksekliği, proteinüri, hematüri

Lökositoz, trombositopeni, LDH ve ılımlı transaminaz yüksekliği

Hastalık şiddeti  Dobrava > Puumala

Hantaan > Seoul

International Journal of General Medicine

Dovepress
Taylor & Francis Group

Open Access Full Text Article

ORIGINAL RESEARCH

Predictors of Severity in Hemorrhagic Fever with Renal Syndrome

Lihua Huang[1,*], Jun Wu[2,*], Jiao Luo[1], Wei Gu[1]

42 şiddetli, 149 hafif seyirli 191 HFRS

Şiddetli grupta yatış süresi uzun, MV-CRRT daha sık, 30-günlük mortalite daha yüksek

Prokalsitonin, hipoalbüminemi, plevral effüzyon hastalık şiddetli ile ilişkili

frontiers | Frontiers in Microbiology

TYPE Systematic Review
PUBLISHED 04 April 2024
DOI 10.3389/fmicb.2024.1329683

Epidemiological and clinical characteristics of death from hemorrhagic fever with renal syndrome: a meta-analysis

Wei Lu[1], Lin Kuang[1*], Yuxing Hu[1], Jialing Shi[1], Qi Li[1] and Wen Tian[2*]

Ölüm ile ilişkili faktörleri araştıran

37 çalışmayı içeren meta-analiz

İleri yaş, sigara, HT, DM

MODS, Serebral bulgular, kardiyak bulgular, karaciğer hasarı, ABH

WBC, PLT, LDH, ALT, AST, aPTT, PT, albümin

Tanı

Serolojik testlerle tanı konulur

ELISA, IFA, İmmunoblot yöntemleriyle Hantavirusa karşı IgM ve IgG antikorları

T.C. SAĞLIK BAKANLIĞI
HALK SAĞLIĞI GENEL MÜDÜRLÜĞÜ

MİKROBİYOLOJİ REFERANS LABORATUVARLARI VE BİYOLOJİK ÜRÜNLER DAİRE BAŞKANLIĞI
GÜNCEL ANALİZLER LİSTESİ

GÜNCELLEME TARİHİ:29.09.2026

AÇIKLAMALAR:

1. Mavi arka fon:	Çalışılmayan testler
2. Pembe arka fon:	Paket testler
3. Ücret sütunu sarı arka fon:	Salgın ve Sürveyans durumunda ücretsiz testler
4. Ücret sütunu mavi arka fon:	Ücretsiz testler

iletişim bilgileri sayfanın sonundadır.

5. Ücret sütunu (***) işaretli testler SUT fiyatlarıdır, SGK tarafından belirlenmektedir.
6. İşgünü sütunu raporlama süresidir. LD: Laboratuvara danışınız.
7. Güncel fiyat listesine ulaşmak için tıklayınız.
8. Aynı hasta için farklı laboratuvarda çalışılan testler için ayrı kaplarda numune gönderilmelidir.

SIRA	Lab. Kodu	LABORATUVAR ADI	KURUM KODU	SUT / HSGM KODU	ANALİZ ADI	YÖNTEM	ÖRNEK MİKTARI/ TİPİ	İş Günü	Ücret
228	2	Viroloji L.		120.194	Hantavirus Antikoru, IgG	ELISA	2 mL Serum	5	
229	2	Viroloji L.	40.079	120.190	Hantavirus Antikoru, IgG	IFA	2 mL Serum	5	
230	2	Viroloji L.	40.098	120.198	Hantavirus Antikoru, IgG	Immunblotting	2 mL Serum	5	
231	2	Viroloji L.		190.207	Hantavirus Antikoru, IgG	Line Immunoassay (LIA)	2 mL Serum	5	
232	2	Viroloji L.		120.196	Hantavirus Antikoru, IgM	ELISA	2 mL Serum	5	
233	2	Viroloji L.	40.080	120.192	Hantavirus Antikoru, IgM	IFA	2 mL Serum	5	
234	2	Viroloji L.	40.029	120.197	Hantavirus Antikoru, IgM	Immunblotting	2 mL Serum	5	
235	2	Viroloji L.		190.208	Hantavirus Antikoru, IgM	Line Immunoassay (LIA)	2 mL Serum	5	
236	2	Viroloji L.		120.199	Hantavirus Dobrova PCR	Real Time PCR	2 mL EDTA'lı tüpte tam kan veya EDTA'lı plazma	3	
237	2	Viroloji L.		120.200	Hantavirus Puumala PCR	Real Time PCR	2 mL EDTA'lı tüpte tam kan veya EDTA'lı plazma	3	

Hantavirüs Enfeksiyonları vaka tanımı:

Klinik Tanımlama

Hantavirüs Renal Sendromla Seyreden Kanamalı Ateş (RSHA)

Ani başlayan ateş (≥38°C) veya ateş öyküsü, trombositopeni ile birlikle aşağıdaki klinik kriterlerden en az birinin bulunmasıdır.

1. Akut böbrek yetmezliği semptomları (oligüri, üre ve kreatinin yüksekliği),
2. Daha önceden bilinen bir hematolojik veya renal hastalığı olmayan bir kişide, aşağıdakilerden en az ikisinin olması:
   - Göz bulguları (konjunktivada kızarıklık, fotofobi, gözlerde ağrı
   - skleralarda yaygın eritem, ani bulanık görme
   - Proteinüri/albuminüri
   - Eleki
   - Hipot
   - Kanam
   - Pulmon
   - Şok.

Hantavirüs Kardiyopulmoner Sendrom (HKPS)

Ani olarak başlayan ateş, üşüme-titreme, myalji, halsizlik şikayetlerini takiben öksürük ve nefes darlığı gelişen hastada aşağıdaki destekleyici bulguların varlığı ile karakt hastalıktır.

- Akciğer grafisinde diffüz, interstisyel infilt
- Artan pulmoner vas

u nötrofili,

Vaka Sınıflaması

Şüpheli Vaka: Tanımlanmamıştır.

Olası Vaka: Klinik tanımlamaya uyan ve epidemiyolojik kriterlerden en az birini sağlayan vaka.

Kesin Vaka: Laboratuvar kriterlerinden en az biri ile doğrulanmış olası vaka.

Epi ik Kriterler

Hastalığın başlamasından önceki iki ay içinde:

1. Kemirici hayvanlarla veya çıkartılarıyla temas.
2. Kemirici hayvanların yaşadıkları yerlerde bulunma.

Laboratuvar Kriterleri

1. Serumda IgM pozitifliği ve/veya IgG'de dört kat titre artışı (ELISA, IFA, İmmunoblot) saptanması.
2. Serumdan veya dokulardan hantavirüs nükleik asidinin saptanması ve genotiplendirilmesi.

Ayırıcı Tanı

Viral kanamalı ateşler

Leptospiroz

Sepsis

Pyelonefrit

Meningokoksemi

Riketsiyözler

İnfluenza

İlaç (NSAİ)

Journal of Medical Virology 84:1790–1796 (2012)

Can Hantavirus Infections Be Predicted on Admission to Hospital?

Selçuk Kaya,[1]* Dilek Yağcı Çağlayık,[2] Yavuz Uyar,[2] Hava Yılmaz,[3] Aynur Engin,[4] Pınar Öngürü,[5] Gurdal Yılmaz,[1] and Iftihar Köksal[1]

- ➔ 35 leptospiroz
- ➔ 15 KKKA
- ➔ 10 tifo
- ➔ 5 GN bakteriyemi
- ➔ 15 non enfeksiyöz
  - ◆ (AML, HÜS, TTP)

20 Hantavirus olgusu ve 80 ayırıcı tanıdaki olgular

Hantavirus olgularında;

Kas ağrısı, karın ağrısı, hematüri ve proteinüri daha sık

Üre, kreatinin, ürik asit, LDH, AST, CRP daha yüksek, trombosit daha düşük

J Vector Borne Dis 61, December 2024, pp. 601–606

The role of clinical and laboratory finding in the differential diagnosis of hantavirus and leptospirosis infections

Ahmet Melih Şahin, Sinan Çetin, İlknur Şenel, Tuğçegül Erdem-Çakır, Emsal Aydın & Meltem Arzu Yetkin

Department of Infectious Diseases and Clinical Microbiology, Giresun University Faculty of Medicine, Giresun, Turkey

202

Başv

Table 3. Receiver operating characteristics (ROC) analysis for calculation of the discriminative ability of laboratory markers for leptospirosis and hantavirus (n=45)

Variable	Cut-off	AUC (95% CI)	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	p-value
Variables used to predict leptospirosis							
Lymphocyte ($\times 10^9$ cells/l)	<0.96	0.785 (0.629-0.941)	55.2	86.7	88.8	50.0	0.002
Total bilirubin (mg/dl)	>1.43	0.787 (0.629-0.945)	50.0	86.7	88.2	46.4	0.002
CRP (mg/l)	>14.1	0.690 (0.537-0.843)	43.3	93.3	92.8	45.2	0.040
ESR (mm/h)	>66	0.738 (0.567-0.909)	47.6	90.9	90.9	47.6	0.029
Variable used to predict hantavirus							
Ferritin (µg/l)	>1,595	0.727 (0.551-0.902)	38.5	95.0	83.3	69.2	0.032

AUC: area underneath the ROC curve; CI: confidence interval; CRP: C-reactive protein; ESR: erythrocyte sedimentation rate; NPV: negative predictive value; PPV: positive predictive value

TÜBİTAK

Turkish Journal of Medical Sciences

http://journals.tubitak.gov.tr/medical/

Research Article

Turk J Med Sci
(2021) 51: 288-296
© TÜBİTAK
doi:10.3906/sag-1912-123

An evaluation of suspected cases of Hantavirus infection admitted to a tertiary care university hospital in Düzce, Turkey, between 2012 and 2018

Nevin İNCE[1,*], Kürşad ÖNEÇ[2], Tansu SAV[2], Mehmet Ali SUNGUR[3], Dilek MENEMENLİOĞLU[4]

[1]Department of Infectious Diseases and Clinical Microbiology, Düzce University Faculty of Medicine, Düzce, Turkey
[2]Department of Nephrology, Internal Diseases, Düzce University Faculty of Medicine, Düzce, Turkey
[3]Department of Biostatistics, Düzce University Faculty of Medicine, Düzce, Turkey
[4]Department of Microbiology Reference Laboratories, National Arboviruses and Viral Zoonoses Unit Public Health Institution of Turkey, Ankara, Turkey

Background/aim: Hantavirus is a rodent borne zoonosis caused by the members of the virus family Bunyaviridae, genus *Hantavirus*. In this study, we aimed to determine the role of peripheral blood leukocyte ratio in differential diagnosis of Hantavirus disease.

Materials and methods: The medical records of patients at the Düzce University Medical Faculty were examined retrospectively. A total of 20 patients diagnosed with hantavirus infection confirmed by serologic tests were included in the study (Group 1). The other group consisted of 30 patients suspected of hantavirus infection but found negative (Group 2). Demographic, clinical and laboratory characteristics, neutrophil/lymphocyte ratio (NLR), platelet/lymphocyte ratio (PLR), and lymphocyte/monocyte (LMR) ratios of both groups were compared.

Results: As a result of the istatistics analysis, no difference was found between the groups' age, sex, and clinical complaints except lethargy-weakness ($P = 0.004$) and diarrhea ($P < 0.001$). Hemogram analysis showed a significant difference between the groups in terms of leukocyte, hemoglobin, hematocrit, platelet, mean platelet volume ($P < 0.05$) and PLR ($P = 0.001$) and LMR ($P = 0.003$) values from peripheral blood leukocyte ratios.

Conclusion: In conclusion, NLR, PLR, and LMR ratios may be useful for clinicians in differential diagnosis of Hantavirus in patients presenting with similar symptoms of Hantavirus disease.

Key words: Hantaviruses, neutrophil/lymphocyte ratio (NLR), platelet/lymphocyte ratio (PLR), monocyte/lymphocyte ratio (PLR), predictive factors, Turkey

Table 2. Laboratory values of the two groups.

	Group 1 (Hantavirus confirmed cases) n = 20	Group 2 (Hantavirus unconfirmed cases) n = 30	P-value
Hematological parameters			
WBC (μL^{-1}) mean (min-max) (n = 3–15)	12.520 (2100-29.400)	6,900 (900–16,700)	**<0.001**
Hgb (g/dL) (n = 8-17)	14.4 ± 2.4	11.7±2.4	**<0.001**
Hct (n = 26–50)	42.5 ± 6.9	34.8 ± 6.8	**<0.001**
Platelet count (μL^{-1}) (min–max) (n = 50-500)	63,500 (10,400–195,000)	131,500 (8000–479,000)	**0.002**
MPV (n = 9-13)	9.9 ± 1.5	8.7 ± 1.1	**0.001**
NLR	4.3 (0.5–10.9)	3.1 (0.2–26.4)	0.289
PLR	29.6 (5.9–140.9)	109 (7.3–575)	**<0.001**
LMR	1.4 (0.7–118.6)	3.4 (0.7–21.5)	**0.003**
PT (s) (n = 11-15)	13.3 ± 3	12.4 ± 1.4	0.233
aPTT (s) (n = 21-35)	29.4 ± 8.7	27.2 ± 4.0	0.311
INR (n = 0.8–1.2)	1.1 ± 0.1	1.1 ± 0.1	0.560
Biochemical parameters			
Urea (mg/dL) (n = 17–43)	89 (14.4–291)	37.7 (12.0–293.1)	0.067
Creatinine (mg/dL) (n = 0.7–1.2)	3.4 (0.7–10.2)	1.2 (0.3–13.4)	**0.006**
CPK (U/L) (n = 0–171)	234.5 (19–2590)	126 (18–2360)	0.471
LDH (U/L) (n = 135–225)	473.5 ± 175.8	313.9 ± 136.9	**0.001**
AST (U/L) (n = 0–50)	59 (10–174.3)	38.5 (9–203)	0.488
ALT (U/L) (n = 0–41)	28 (6.4–133)	25.5 (2.5–166.7)	0.692
Bilirubin (mg/dL) (n = 0.3–1.2)	0.4 (0.2–12)	0.5 (0.1–18.6)	0.329
ALP (U/L) (n = 30–120)	59 (30–93)	80.5 (39–150)	**0.001**
Albumin (g/dL) (n = 3.5–5.2)	3.2 ± 0.5	3.5 ± 0.8	0.165
CRP (mg/dL) (n = 0–5)	7.3 (0.8–16.3)	5.3 (0.1–38.6)	0.699

WBC: white blood cell; Hgb: Hemoglobin, Hct: hematocrit; MPV: mean platelet volume; NLR: neutrophil to lymphocyte ratio, PLR: Platelet to lymphocyte ratio, LMR: Lymphocyte to monocyte ratio.
CPK: creatinine phosphokinase; LDH: lactate dehydrogenase; AST: aspartate transaminase; ALT: alanine transaminase; AL: alkaline phosphatase; PT: prothrombin time; aPTT: partial thromboplastin time; INR: international normalized ratio; CRP: C-reactive protein.

Tedavi

Destek tedavisi

- Sıvı elektrolit tedavisi
- Kan basıncı takibi
- Oksijen desteği

Diyaliz

Trombosit ve kan ürünleri replasmanı

Ribavirin ?

Kortikosteroid?

Ikatibant?

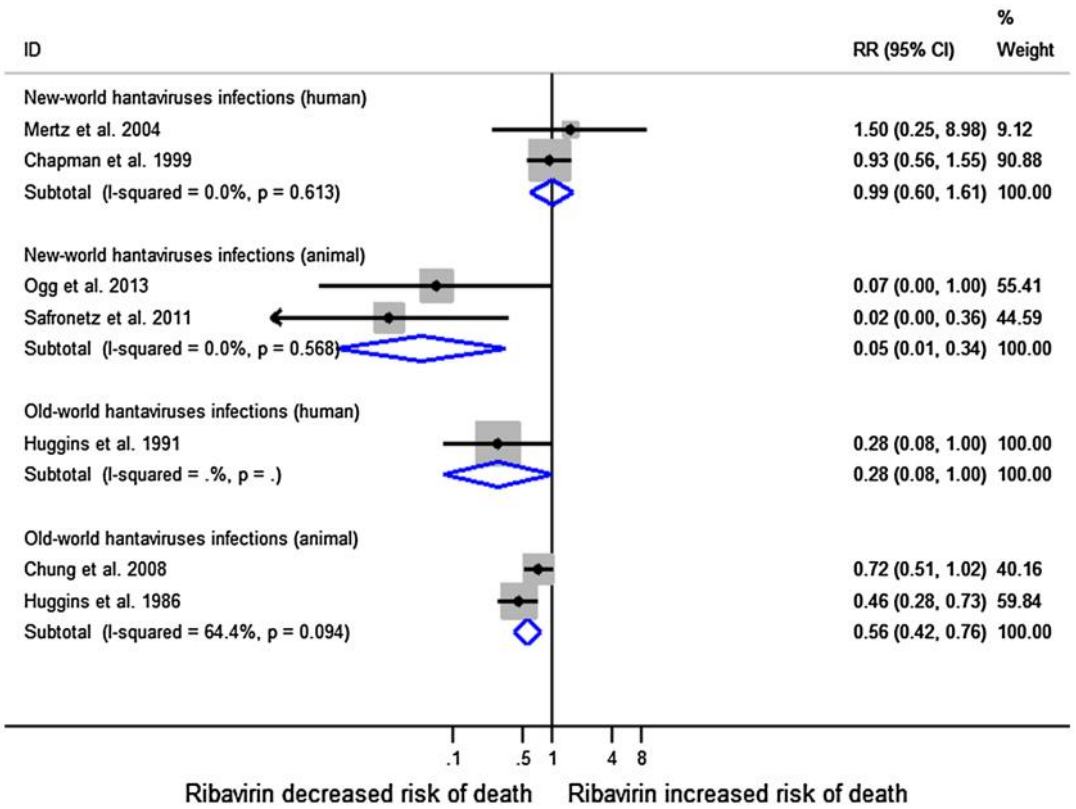
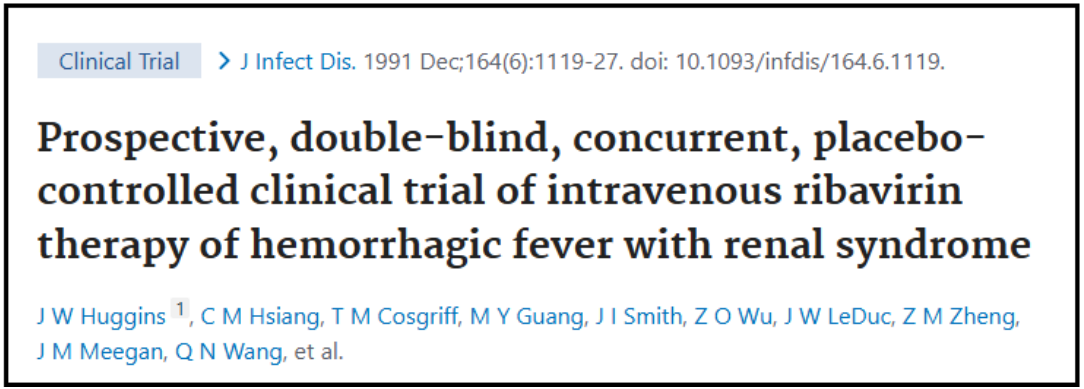


Fig. 1 Forest plot showing the RR (95 % CI) for treatment of hantaviruses infections with ribavirin. The drug was applied for the treatment of new or old- world hantaviruses infections. The *size of square* indicates the study size, and pooled estimated is denoted by a *diamond* at the bottom



1991 yılından bir makale

Çin'de 242 HFRS olgusu

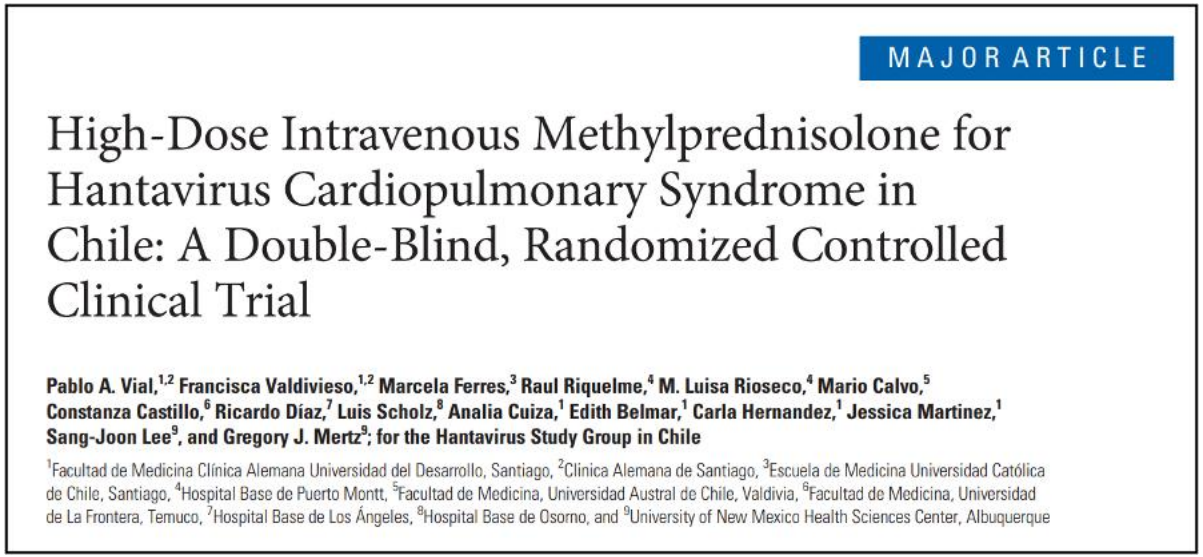
Ribavirin yükleme 33mg/kg, 4x16 mg/kg 4 gün, 3x8 mg/kg 3 gün IV

Mortaliteyi azalttığı, kanamayı azalttığı gösterilmiş

Lancet Infect Dis'teki bir derleme bu makaleyi kanıt açısından "yetersiz" nitelendiriyor

Vial PA, et al. Hantavirus in humans: a review of clinical aspects and management. Lancet Infect Dis. 2023

Kortikosteroidlerin yeri var mı?



MAJOR ARTICLE

High-Dose Intravenous Methylprednisolone for Hantavirus Cardiopulmonary Syndrome in Chile: A Double-Blind, Randomized Controlled Clinical Trial

Pablo A. Vial,[1,2] Francisca Valdivieso,[1,2] Marcela Ferres,[3] Raul Riquelme,[4] M. Luisa Rioseco,[4] Mario Calvo,[5] Constanza Castillo,[6] Ricardo Díaz,[7] Luis Scholz,[8] Analia Cuiza,[1] Edith Belmar,[1] Carla Hernandez,[1] Jessica Martinez,[1] Sang-Joon Lee[9], and Gregory J. Mertz[9]; for the Hantavirus Study Group in Chile

[1]Facultad de Medicina Clínica Alemana Universidad del Desarrollo, Santiago, [2]Clínica Alemana de Santiago, [3]Escuela de Medicina Universidad Católica de Chile, Santiago, [4]Hospital Base de Puerto Montt, [5]Facultad de Medicina, Universidad Austral de Chile, Valdivia, [6]Facultad de Medicina, Universidad de La Frontera, Temuco, [7]Hospital Base de Los Ángeles, [8]Hospital Base de Osorno, and [9]University of New Mexico Health Sciences Center, Albuquerque

Çift kör RCT

30 tedavi vs 30 placebo

8 mg/kg metilprednizolon

Anlamlı klinik yarar gösterilmemiş, HPS'da kullanımı önerilmemiş

Kortikosteroidlerin yeri var mı?

Review > Ther Apher Dial. 2013 Aug;17(4):402-6. doi: 10.1111/1744-9987.12086.

Successful treatment of severe hantavirus nephritis with corticosteroids: a case report and literature review

Maja Martinuč Bergoč [1], Jelka Lindič, Damjan Kovač, Dušan Ferluga, Jernej Pajek

Dobrava HFRS sonrası düzelmeyen renal fonksiyon ve HD ihtiyacı olan hastada biyopside nekrotizan tübülointerstisyel nefrit

Yüksek doz metilprednizolon ile iyileşme

Review > Am J Kidney Dis. 1998 Jan;31(1):116-20. doi: 10.1053/ajkd.1998.v31.pm9428461.

Severe thrombocytopenia and response to corticosteroids in a case of nephropathia epidemica

R Dunst [1], T Mettang, U Kuhlmann

Puumala HFRS sonrası renal fonksiyon tamamen düzelen ancak 2000/mm3 düzeyinde persistan trombositopeni olan hasta

Prednizolon ile iyileşme

Case Reports > Front Med (Lausanne). 2022 Dec 12:9:1096900. doi: 10.3389/fmed.2022.1096900. eCollection 2022.

Case report: Hemorrhagic fever with renal syndrome presenting as hemophagocytic lymphohistiocytosis

Maarten A J De Smet [1], Simon Bogaert [1], Alexander Schauwvlieghe [2], Amélie Dendooven [3], Pieter Depuydt [1], Patrick Druwé [1]

Puumala HFRS sonrası HLH

- hipertrigliserit, Kİ hemofagositoz, yüksek ferritin, yüksek soluble CD25

IVIG + deksametazon 20 mg ile iyileşme

Finlandiya’dan bir görüş: İkatibant?

Case Reports > Infect Dis (Lond). 2015 Feb;47(2):107-11. doi: 10.3109/00365548.2014.969304. Epub 2014 Dec 12.

Severe Puumala virus infection in a patient with a lymphoproliferative disease treated with icatibant

Outi Laine [1], Ilona Leppänen, Sirpa Koskela, Jaakko Antonen, Satu Mäkelä, Marjatta Sinisalo, Antti Vaheri, Jukka Mustonen

KLL tanısı olan hastada gelişen Puumala HFRS, çoklu organ yetmezliği, CRRT ve mekanik ventilasyon

30 mg ikatibant SC ve 6 saat sonra doz tekrarı ile iyileşme

Case Reports > Antiviral Res. 2014 Nov:111:23-5. doi: 10.1016/j.antiviral.2014.08.007. Epub 2014 Sep 3.

Pathophysiology of a severe case of Puumala hantavirus infection successfully treated with bradykinin receptor antagonist icatibant

Antti Vaheri [1], Tomas Strandin [2], Anne J Jääskeläinen [3], Olli Vapalahti [4], Hanna Jarva [5], Marja-Liisa Lokki [2], Jaakko Antonen [6], Ilona Leppänen [6], Satu Mäkelä [7], Seppo Meri [5], Jukka Mustonen [7]

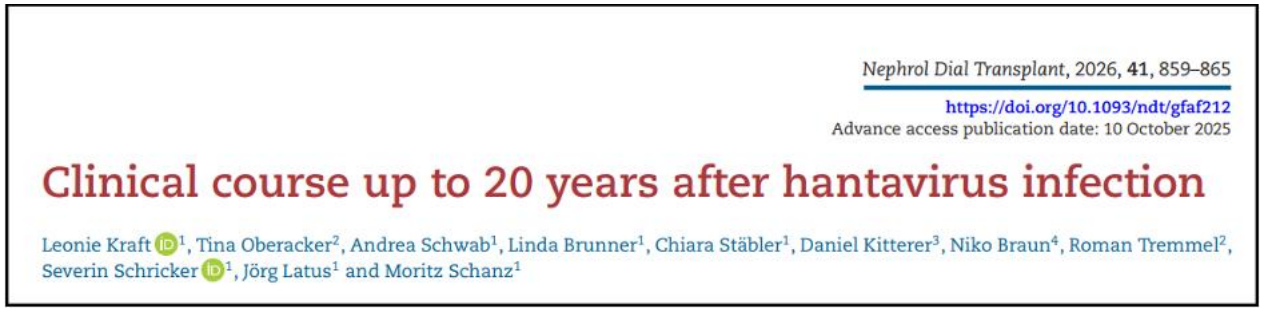
Case Reports > Scand J Infect Dis. 2013 Jun;45(6):494-6. doi: 10.3109/00365548.2012.755268. Epub 2013 Jan 7.

A severe case of Puumala hantavirus infection successfully treated with bradykinin receptor antagonist icatibant

Jaakko Antonen [1], Ilona Leppänen, Jyrki Tenhunen, Pertti Arvola, Satu Mäkelä, Antti Vaheri, Jukka Mustonen

Herediter anjioödem tedavisinde kullanılan bradikinin reseptör antagonisti

Prognoz



Nephrol Dial Transplant, 2026, 41, 859–865
https://doi.org/10.1093/ndt/gfaf212
Advance access publication date: 10 October 2025

Clinical course up to 20 years after hantavirus infection

Leonie Kraft[1], Tina Oberacker[2], Andrea Schwab[1], Linda Brunner[1], Chiara Stäbler[1], Daniel Kitterer[3], Niko Braun[4], Roman Tremmel[2], Severin Schricker[1], Jörg Latus[1] and Moritz Schanz[1]

156 ABH gelişen PUUV HFRS hastası

Medyan takip 156 ay (IQR 137-168)

Kan basıncı, böbrek fonksiyonları, idrar analizi

KBH %8 hastada gelişmiş, Hematüri %6 hastada gelişmiş, Takipte HT gelişme oranı %78

PUUV spesifik IgG takipte tüm hastalarda pozitif kalmış

HFRS sonrası artmış KBH insidansı saptanmamış

Önleme

Kemirgen kontrolü

Nadir kullanılan yapılarda girişler öncesinde havalandırma yapılmalı

Aerosol oluşumunu önlemek için, temizlik yapılacaksa önce %10'luk çamaşır suyu ile ıslatılmalı

Andes dışındakilerde standart önlemler + aerosolizasyon oluşturacaksa solunum önlemleri

FDA ya da EMA (european medicine agency) onaylı aşı yok

Çin ve Güney Kore de HTNV ve SEOV için inaktive aşı mevcut


29 Ekim
Cumhuriyet Bayramımız
Kutlu Olsun