Clinical Characteristics of Ratborne Seoul Hantavirus Disease

Appendix

Appendix Table. Clinical characteristics of ratborne Seoul hantavirus disease

Clinical symptoms common for HFRS, but also for HCPS
- Abdominal complaints (3–5 d); sudden high fever, malaise, vomiting and diarrhea, severe gastrointestinal pains, mimicking acute appendicitis (1–4)
- Headache and influenza-like myalgiae, but no premonitory upper airways symptoms evoking influenza: no rhinorrhea or throat ache
- Initial eye pain and periorbital edema
- Facial flushing, pharyngeal congestion (5)
- (Micro-)hemorrhages, sometimes limited to conjunctival suffusion or intraoral petechiae† (5–8)
- Dry cough, followed by dyspnea (7–14), outspoken and rapidly worsening in HCPS

Clinical symptoms reported for HFRS, not for HCPS
- Acute myopia (2–3 d) as a virtually pathognomonic, but transient sign (6,7,14); rarely acute bilateral glaucoma or retinal hemorrhage (15)
- Severe flank pain (lumbalgia), sometimes unilateral, mimicking a renal colic (16,17)
- Rarely acute bilateral glaucoma or retinal hemorrhage (15)
- Transient acalculous acute cholecystitis provoking right upper quadrant pain and a positive Murphy sign (18–20); considered a general severity sign (21)
- Paradoxical sinusus bradycardia (<90 bpm), despite fever >38°C (6,7)

Laboratory anomalies mainly reported for HFRS
- Initial thrombocytopenia is the earliest and most constant sign‡ (4–6)
- Urine spot PCR§ >0.11 plus microhematuria; early (mostly before hospitalization) and rapidly evolving, but cardinal sign, easy, and cheap to assess day-by-day
- Hyponatremia and hypoalbuminemia, predicting clinical severity‡ (5,8,12,22)
- Highly increased levels of LDH, and particularly of CRP and PCT, mimicking hemolysis (18,22) or a bacteria, rather than a virus, infection (6–8)
- Lipid paradox: low acute cholesterolemia (particularly decreased high-density lipoprotein–cholesterol levels), mimicking hypertriglyceridemia, both transitory (7,18,23,24)
- Serum creatinine levels might remain initially (18,20) or constantly (4,7,25–27) at standard levels, or barely and briefly increased (28)
- Slight-to-frank hypokalemia, despite often clearly impeded renal function (8,29)

Ultrasound anomalies, reported more for HFRS than for HCPS
- Third-space, protein-rich fluid effusions: (pleuritis, pericarditis, ascites)
- Longitudinal renal diameter >11 cm¶ (17,18), swollen cortex with echodensity greater than or equal to that for liver. Rare but virtually present or absent pathognomonic sign; perirenal fluid rim
- Transient hepatomegaly and splenomegaly (4,8,17)
- AAC with mostly distended large gallbladder, and thickened (>4.5 mm) edematous gallbladder wall (18–21)

Liver involvement suggesting Seoul virus (SEOV) involvement
- Aminotransferase levels increased to 10–20 times (or more) above the standard level (4,12,26) versus mild or no transaminitis in other HFRS forms (6–8); concomitant renal function impediment might be conspicuously absent (4,7)

*All signs or symptoms are in present or absent chronologic order of appearance. Bold indicates a high diagnostic value. A general common feature is rapid self-remittance within days or weeks without leaving any sequela (6). Ultrasound-documented renal shrinking within days is highly suggestive for HFRS. AAC acute cholecystitis; bpm, beats per minute; CRP, C-reactive protein; HCPS, hemorrhagic fever with renal syndrome; LDH, lactate dehydrogenase; PCR, protein-to-creatine ratio; PCT, procalcitonin.
†Rare to absent in HCPS, except in Andes virus (ANDV)–induced forms (5).
‡Also present in HCPS.
§Urine spot PCR, or urinary protein-to-creatine ratio, is calculated in milligrams per deciliter or grams per liter; standard value for adults is <0.11. Urine spot PCR is also a surrogate for 24-h protein excretion in g/day, indicating that a urinary protein-to-creatine ratio >3.5 is nephrotic-range proteinuria or equivalent to a dipstick value of ++++(+)
¶Standard range 11–12 cm depending on body size. Ultrasound-documented renal shrinking within days is highly suggestive for HFRS.
References


