Clinical Characteristics of Ratborne Seoul Hantavirus Disease

Appendix

Appendix Table. Clinical characteristics of ratborne Seoul hantavirus disease*

<table>
<thead>
<tr>
<th>Clinical symptoms common for HFRS, but also for HCPS</th>
<th>Laboratory anomalies mainly reported for HFRS</th>
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<tbody>
<tr>
<td>Headache and influenza-like myalgiae, but no premonitory upper airways symptoms evoking influenza: no rhinorrhea or throat ache</td>
<td>Initial thrombocytopoenia is the earliest and most constant sign† (4–6)</td>
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<td>Initial eye pain and periorbital edema</td>
<td>Urine spot PCR§ &gt;0.11 plus microhematuria; early (mostly before hospitalization) and rapidly evolving, but cardinal sign, easy, and cheap to assess day-by-day</td>
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<td>facial flushing, pharyngeal congestion (5)</td>
<td>Hydroxatemia and hypoalbuminemia, predicting clinical severity‡ (5,8,12,22)</td>
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<td>Initial acute gastrointestinal pains (3–5 d); sudden high fever, malaise, vomiting and diarrhea, severe gastrointestinal pains, mimicking acute appendicitis (1–4)</td>
<td>Highly increased levels of LDH, and particularly of CRP and PCT, mimicking hemolysis (18,22) or a bacteria, rather than a virus, infection (6–9)</td>
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<tr>
<td>Dry cough, followed by dyspnea (7–14), outspoken and rapidly worsening in HCPS</td>
<td>Lipid paradox: low acute cholesterolemia (particularly decreased high-density lipoprotein–cholesterol levels), mimicking hemolysis (18,22) or a bacteria, rather than a virus, infection (6–9)</td>
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<td>Liver involvement suggesting Seoul virus (SEOV) involvement</td>
<td>Serum creatinine levels might remain initially (18,20) or constantly (4,7,25–27) at standard levels, or barely and briefly increased (28)</td>
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<td>Severe flank pain (lumbalgia), sometimes unilateral, mimicking a renal colic (16,17)</td>
<td>Slight-to-frank hypokalemia, despite often clearly impeded renal function (8,29)</td>
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<td>Rarely acute bilateral glaucoma or retinal hemorrhage (15)</td>
<td>Ultrasound anomalies, reported more for HFRS than for HCPS</td>
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<td>Transient acalculous acute cholecystitis provoking right upper quadrant pain and a positive Murphy sign (18–20); considered a general severity sign (21)</td>
<td>Third-space, protein-rich fluid effusions: (pleuritis, pericarditis, ascites)</td>
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<td>Clinical symptoms reported for HFRS, not for HCPS</td>
<td>AAC with mostly distended large gallbladder, and thickened (&gt;4.5 mm) edematous gallbladder wall (18–21)</td>
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<tr>
<td></td>
<td>Liver involvement suggesting Seoul virus (SEOV) involvement</td>
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<td></td>
<td>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)</td>
</tr>
</tbody>
</table>

*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 sequelae (6). Ultrasound-documented renal shrinking within days is highly suggestive for HFRS.AAC acute cholecystitis; bpm, beats per minute; CRP, C-reactive protein; HCPS, hantavirus cardiopulmonary syndrome; HFRS, 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 ++ (+).
References


