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CONCISE ARTICLE

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Tula Virus Infection Associated with Fever and Exanthema After a Wild Rodent Bite

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Abstract Reported here is the first case of human acute infection with Tula virus, which occurred in a 12-year-old boy in Switzerland. This hantavirus had been considered apathogenic to humans, and in Switzerland only TULV-genome sequences have been demonstrated in wild rodents to date. In this case, paronychia, fever and exanthema occurred after the patient was bitten by a wild rodent, indicating an unusual route of hantavirus transmission. Thus, Tula virus infection should be taken into account in patients with appropriate clinical symptoms and contact with rodents.

Introduction

Hantaviruses are carried by rodents worldwide, and transmission to humans causes an estimated 60,000 to 100,000 hospitalisations annually [1]. In 1994, a novel member of the genus *Hantavirus*, called Tula virus (TULV), was reported. The virus was first discovered in lung samples of European common voles (*Microtus arvalis* and *Microtus rossiaemeridionalis*) trapped in Tula, 100 km south of Moscow, in 1987 [2] and later detected in voles from the Czech Republic, Slovakia and Austria [3, 4]. So far, TULV has been considered apathogenic to humans, since TULV-specific antibodies have only been found in one serum sample obtained from a healthy blood donor in the Czech Republic [5]. As rodent carriers of hantavirus are endemic in Switzerland, hantaviral infections are likely to occur, but among wild rodents, the presence of TULV-genome sequences only has been demonstrated to date [6].

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Case Report

In August 2000, a 12-year-old boy from Kaiseraugst in the northwestern part of Switzerland caught a small rodent sheltering in a sandal. Some hours later, the rodent bit the boy in the distal joint of his left index finger. Eight days later, a paronychia had developed, and it was incised by his paediatrician. The same day, the boy developed fever (39.5°C) and his general condition worsened. Over a period of 3 days, the fever and the paronychia subsided without medication. Seven days later, he experienced another bout of fever (40°C) of several hours' duration. After a third febrile episode (39°C) occurred 39 days after the rodent bite and lasted for 3 days, the boy was admitted to hospital.

On examination he was afebrile. The distal joint of his index finger was still red and swollen, but it was painless and freely movable without axillary adenopathy. The bite wound had already closed up and a radiograph of his finger was nondiagnostic. A faintly red, macular and nonitching exanthema was confined to his trunk and his proximal limbs, changing from macular to reticular and back in daily alternation. Neither oral mucosal lesions nor conjunctivitis was visible. Abdominal ultrasonography revealed a slightly enlarged spleen. In the evening he again became feverish (38.5°C) for some hours, but afterwards he remained afebrile. His medical history was unremarkable and there were no known allergies. He had received all recommended vaccinations and had not received any medication after the rodent bite.

Laboratory findings were as follows: erythrocyte sedimentation rate, 38 mm/h (normal, <10 mm/h) on admission and 29 mm/h on day 4; C-reactive protein, 43.7, 55.4 and 27.1 μg/dl on admission, day 4 and day 7, respectively (normal, <10 μg/dl); leucocyte count, 12.6×10^9/l (normal, $3.5–10\times10^9$/l) with 81.5% neutrophils, 23.5% bands, 13% lymphocytes, 4.5% monoyctes, 354×10^9/l platelets (normal, $150–400\times10^9$/l) and hemoglobin 12.4 g/l (normal, 11.8–15 g/l); anti-DNaseB, 450 U/ml and antistreptolysin O, <200 U/ml (normal, <200 U/ml); antinuclear antibodies, 1:160 (normal, 1:<80); and anti-U1-ribonucleoprotein antibodies positive (24 E/ml; normal, <7 E/ml). Normal values and negative results were obtained from the following tests and inves-