FIRST REPORT OF AN INFECTION WITH RICKETTSIA SLOVACA

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Abstract. A description was given of an infection with *Rickettsia slovaca* following a tick bite. The clinical picture was that of an acute meningoencephalitis. Its etiology was confirmed serologically by an increase in complement-fixing antibodies, from negative values to diagnostically significant titers. There were febrile relapses and a prolonged persistence of neurasthenic disorders.

In 1968, two rickettsial strains were isolated from ticks of the species *Dermacentor marginatus* (Brezina et al. 1969). As indicated by provisional serological tests, the strains belonged to the Rocky Mountain group of spotted fevers, and were closely related to *R. sibirica*. However, detailed antigenic studies disclosed that the isolated strains differed from all known strains of this group (*R. conori, R. rickettsii, R. akari, R. sibirica*). The evidence obtained justified the establishment of a new species for which the authors suggested the name *R. slovaca* (Brezina et al. 1969). Detailed studies of the problem (Reháček et al. 1972, 1976) resulted in the finding of a high incidence of an infection in ticks of the species *Dermacentor marginatus*; serological tests confirmed the infection in small rodents mainly *Apodemus flavicollis* and *Clethrionomys glareolus*. In 1969 and 1970, Reháček et al. (1972) examined persons from localities where the rickettsial species had been isolated, and found a serological positivity in 3.4—12% of the persons examined. Having regard to a lower virulence of the new species in comparison with that of all other species of the group, a point to be cleared was the question whether the new species would be able to cause an apparent illness manifesting itself in the clinic. After *R. slovaca* had been discovered we started to examine our clinical material for cases which might have been caused by *R. slovaca*.

CASE REPORT

A 33 year-old female cleré from Košice reported to have found, on May 21 1978, two ticks on her body, one attached to below her left breast, one to her left thigh. On the day in question, she had been working in her garden above the village of Lorencík, Košice district, situated near the edge of a deciduous forest. She had acquired the plot of land, formerly an uncultivated field, three years ago. Apart from her garden, the patient maintained to have not been to any other part of the country during the spring of 1978. On the day of the tick bite, she had worn a bathing costume, but had not been lying on the ground. Her son, who had been with her in the garden, had also a tick attached to his body, which his father removed the same day. According to his recollection, its colour was reddish brown. On May 26 1978, the patient developed a temperature which soon was followed by tremor and weakness, myalgia and arthralgia. Three days later, she started to complain of a prickling and pressing pain in her head, of a general weakness and tiredness. Her head felt heavy and she was suffering from dizziness. After another two days, she had a sensation of prickingness in her upper and lower extremities, and complained of a pain in the waist. Since her state of health showed no signs of improvement on the 6th day of the illness, she was admitted to the Clinic for Infectious Diseases with the tentative diagnosis: tick-borne meningoencephalitis. She appeared to be more bradypychical after her admittance to the hospital, but continued to suffer from a headache (both spontaneous and reacting to tapping). Her sclera were injected, the liver was palpable in the spiremum which was of a denser consistence. BP 90/60 Torr, P 80/min, T — 37.5°C. Under her left

Conclusions: Inocipient syndrome of meningeal irritation, incomplete rightsided hemiparesis.

Results of lumbar puncture: Liquor — issuing under pressure. Pandy reaction $\pm$. There cells per cubic millimeter, all lymphocytes, proteins 82 mg %, sugar 91 mg %, chlorides 430 mg %.

Laboratory findings: Red component of the blood picture unchanged, leukocytes 6,300 with 49 % neutrophiles, 2 % monocytes, 49 % lymphocytes. Urine analysis neg. FW 11/33.

In the later course of the illness, the temperature decreased to the value recorded at 48 hr after admission but the headache persisted and became even worse and more intense. The patient complained of pains all over her head but was unable to locate them. She suffered from giddiness and insomnia, a lack of concentration, she was nervous and tearful. She was treated symptomatically, without antibiotics because we assumed that the illness was caused by a virus. Upon admission to the clinic, she was given gamma globulin (5.7 ml). In the following days, the meningeal irritation was slowly subsiding, and there was also a slight improvement on the eyes in that there persisted only a fixate nystagmus of the eyeballs when looking sideways. Babinski right inconstant. The EEG showed slightly irregular curves at the beginning of the native part, with a dominance of alpha activity without more marked deviations in the sense of a focal or lateral organic lesion of the central nervous system. The inflammatory activity of the infiltrate below the left breast (the site of the tick bite) ceased after a fortnight. It changed slowly from the original red to a brown colour. After 20 days in the hospital, the patient was discharged in an improved state. Several nervous disorders persisted. These were: Bilateral horizontal nystagmus grade I. Less show of teeth on right side. Nape loose. Reflexes $C_{1-2}$, $L_2 - S_2$, symmetrical, lively. Slight deviation of the right upper extremity to the left in Mingazzini’s position. Dufor right indicated.

Conclusions: Improvement of neurological abnormalities, minute residual neurological signs and light, vestibular symptomatology.

After her discharge from the hospital, the patient felt relatively better. However, 6 days later, her temperature went up to 38 °C, and again, she started to complain of dizziness, of a sensation of prickliness in her left extremities, nausea, tinnitus. She did not feel a pain in her head, but was depressed and tearful. She was given sedatives, Enerbol, vitamins, Prothiodon. Shortly afterwards, there was a subjective improvement, the temperature subsided, but a fortnight later pseudoneurasthenic disorders reappeared. She could neither endure sun nor heat, her head was aching, and she complained of lumbar pain with a radiculitis of $S_1$ on the right side. The EEG made on July 24 1978 showed a dominance of alpha activity with minute irregularities, and without a differentiation of focal changes (similar to the previous EEG). A re-appearance of an increased temperature during this phase, and a positive serological result suggesting a rickettsial etiology of the illness initiated our treatment of the patient with tetracycline 6 weeks after her discharge from the hospital administering a dose of 2 g/day for a fortnight. The temperature subsided, the patient was less tired. However, she complained of a "bubbling head" without a headache. Shortly afterwards, neurasthenic disorders reappeared together with an increase in temperature and therefore we repeated the treatment, giving her vibramycine for 10 days. Three months later, a neurological control examination disclosed a persisting, leftsided, reflexological superiority. Both the depressive symptomatology and the fatigue syndrome had subsided. The complete resorption of the infiltrate below the breast required four months. The patient was disabled from work for 5 months.

RESULTS AND DISCUSSION

Pending on the evidence available, i.e., the tick bite, the clinical picture, positive serological results, and a confirmation based on results of serological tests that the disease in question was not a viral, tick-borne meningoencephalitis, we were inclined to believe that the infection from which the patient recovered was caused by *R. slovaca*.

The description of the attached tick given by the husband of the patient was too vague to exclude the possibility of an exposure to *Dermacentor marginatus*, an abundant species in the locality where the patient had been attacked by the two ticks. The serum of the patient when examined with other antigens, was negative for *R. prowazekii*.
R. mooseri, C. burnetii, R. akari and R. sibirica. All serological examinations were made concomitantly in one test. In order to eliminate a tick-borne viral meningoencephalitis, we used the complement-fixation test and the virus-neutralizing test. According to Brezina et al. (1969), strains of R. slovaca were not too virulent, but might be capable to cause individually an apparent illness with a distinct, clinical picture. Therefore, in cases with a clear-cut history of tick exposure, the clinician would be well-advised to consider, in addition to a viral infection, other possibilities such as, e. g., rickettsioses, particularly an infection with R. slovaca or others, mainly with a view on a utilization of therapeutic possibilities. In the case of a rickettsial infection, the treatment with antibiotics indicated by rickettsiostatic substances, might result in a successful recovery and prevent complications.

Table 1. Results of the detection of antibodies against R. slovaca, R. conori, R. sibirica with the CF-test in the patient T. M.

<table>
<thead>
<tr>
<th>Date</th>
<th>Serum collection</th>
<th>R. slovaca sol.</th>
<th>R. slovaca corp.</th>
<th>R. conori</th>
<th>R. sibirica</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>June 12 1978</td>
<td>16</td>
<td>32</td>
<td>16</td>
<td>neg.</td>
</tr>
<tr>
<td></td>
<td>June 23 1978</td>
<td>8</td>
<td>16</td>
<td>4</td>
<td>neg.</td>
</tr>
<tr>
<td></td>
<td>April 15 1979</td>
<td>16(32±)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pathogenically, the disease is essentially an intracellular infection of small, peripheral blood vessels with rickettsiae displaying a particular predilection to the central nervous system. This accounts for frequent neurological manifestations or neurological complications typical of these infections. Similar to patients after their recovery from typhus fever, a permanent or partial damage mainly of the central nervous system might also be found in patients after their recovery from Rocky Mountain spotted fever. Thomas and Berlin (1948) observed severe, neurological changes and an intermittent, nodal tachycardia. Rosenblum et al. (1952) stated that neurological abnormalities persisted for a period from 1—8 years in 21 out of 37 patients after their recovery from RMSF; encephalographic tracings were clearly abnormal in 12 of these patients, in 12 additional patients the EEG showed borderline abnormalities. It is worth emphasizing that a complete recovery from a severe attack with RMSF might last from several months to one year, and sometimes, a restitutio ad integrum might never occur.

A rash regarded as pathognomonic to the group of spotted fevers was not present in our clinical picture. Warthen and Burdieck (1950), and Green et al. (1978) maintained that an exanthema was not an essential presupposition of this group of spotted fevers. Both referred to cases in which an infection with RMSF was not accompanied by an exanthema. Although treatment should be started at the earliest possible time in order to forgo complications, it should be remembered that the production of antibodies is suppressed by this treatment, and that this might be a major deterrent to the serological diagnosis. A primary lesion at the site of the tick bite ranging in size from a pinhead to a pea, has been found in about 50% of patients with tick-borne fevers of a rickettsial etiology. The surface of the infiltrate is exulcerated, covered with a brownish black crust and circumscribed by an inflammatory rim of varying width. The primary lesion heals very slowly, sometimes it cicatrizes.
REFERENCES


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Received 14 December 1979.