Imported aseptic meningitis due to Toscana virus acquired on the island of Elba, Italy, August 2008

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We describe a case of aseptic meningitis due to Toscana Virus imported to Switzerland and discuss the epidemiological situation. To our knowledge this is the first description of this infection acquired on the Island of Elba.

Introduction

In Switzerland, aseptic meningitis is frequently encountered and most often caused by enteroviruses, flaviviruses (tick-borne-encephalitis), herpes simplex virus type 1 and 2, varicella-zoster virus or mumps and measles viruses. Other arthropod-borne viruses that can cause clinical signs of meningoencephalitis, such as West Nile virus, have been detected in other parts of Europe and also in countries around Switzerland (e.g. Italy, France), but not as yet in Switzerland itself.

Toscana virus (TOSV) was first isolated from in a sandfly (*Phlebotomus peniciosus*) in central Italy in 1971 and identified as a common cause of aseptic meningitis in this country. Since then, it has been detected in other countries around the Mediterranean. Studies carried out in Italy have shown that the virus circulates not only in Tuscany but also in other regions such as Emilia Romagna, Marches, Umbria and Piedmont [1]. So far no data can be found about infections acquired on the islands off the coast of Tuscany, including Elba.

Case Report

On 10 August 2008, a man in his twenties was admitted to the emergency department of the Hospital of Lucerne, based in the central part of Switzerland. He suffered from a pronounced headache since the previous day and recurrent vomiting.

He had stayed on the island of Elba for two weeks and returned home on 8 August. From 27-31 July, he had stayed at a camp site east of Portoferraio, before moving to the southern part of the island (near Marina di Campo) for the remaining week. The entire holiday was spent exclusively on Elba, with no major stopovers on the way home from Piombino, the mainland port for the ferry to Elba.

At the camp site, the patient usually slept outside the tent on a canvas chair, the ground was sandy and hard

On admission, the patient had a neck rigidity without clinical signs of encephalitis or fever.

White blood cell count and C-reactive protein levels were normal. Cerebrospinal fluid (CSF), taken on the day of admission, was clear and showed a white blood cell count of 196/mm3 (85% mononuclear cells), protein levels of 0.75 g/L and glucose levels of 3.7 mmol/L (the glucose level in the blood was 6.9 mmol/L). Gram stain was negative and culture showed no microorganisms. PCRs for herpes simplex virus type 1 and 2, varicella-zoster virus und enteroviruses were negative. Serology for *Borrellia burgdorferi* and tick-borne encephalitis virus showed no signs of active infection.

Because the patient had stayed on the Island of Elba, TOSV meningitis was considered and confirmed by indirect immunofluorescence that showed high titres of anti-TOSV IgM and IgG, antibodies ("Sandfliegenfieber-Viren-Mosaik", Euroimmun, Lübeck, Germany). Antibody titres against other sandfly fever viruses (sandfly fever Naples virus (SFNV), sandfly fever Sicilian virus (SFSV), and sandfly fever Cyprus virus (SNCV)) were found to be low or negative.

Although a PCR of the CSF taken on the day of admission could not detect TOSV genome, the negative PCR result does not exclude an acute infection with TOSV as the virus rapidly becomes undetectable after the appearance of antibodies.

The patient recovered completely within three days. Apart from analgetic medication, no further treatment was necessary.

Discussion

TOSV belongs to the genus *Phlebovirus*, family Bunyaviridae. The *Phlebovirus* genus currently comprises 68 antigenically distinct serotypes, eight of which have been linked to diseases in humans. Three *Phlebovirus* serotypes are of importance in Europe: SFSV, SFNV and TOSV. While the first two cause a febrile illness, TOSV is characterised by its neurotropism and the clinical characteristics of meningitis, meningoencephalitis and influenza-like illness. As stated in several studies and case reports, TOSV is circulating not only in Italy but also in Algeria, Spain, Portugal, France and Cyprus [2-9]. In central Italy, a seroprevalence of approximately 20% could be detected [10] whereas in Granada, southern Spain, the overall prevalence of anti-TOSV IgG antibodies was almost 25% [11]. In both countries, the seroprevalence was significantly higher in older age groups and in the rural population, indicating exposition throughout life and a higher vector density in the rural areas.

Transmission of the virus to humans results from the bite of small female phlebotomine sandflies (*P. perniciosus* und *P. perfiliewi*). The activity of sandflies is mainly crepuscular or nocturnal. During the summer months, concomitant with the period of maximum activity of the sandfly vectors in August, TOSV appears to be one of the major viral pathogens causing aseptic meningitis in tourists as well as in the local population of the Mediterranean countries [12].

TOSV infections have an incubation period of three to six days. The clinical picture is variable: In addition to meningitis and meningoencephalitis few cases of encephalitis without meningitis have been described [13]. The high seroprevalence suggests that asymptomatic infection is rather common and TOSV therefore probably under-recognised. In a study performed in the area around Florence, Siena and Arezzo, forestry workers with high occupational risk of TOSV infection showed a seropositivity rate of over 75% with negative history of neurological symptoms. This confirms that TOSV infection can be very mild or even completely free of symptoms [10].

To our knowledge, this is the first description of TOSV meningitis acquired on the Island of Elba. However, the geographic proximity to areas where the disease is endemic and which have a very similar climate, suggest that phlebotomes occur on Elba. Despite millions of visiting tourists and an increasing number of TOSV infections around the Mediterranean Basin, TOSV is still rarely considered as the cause of aseptic meningitis in returning travellers. Either it is not diagnosed, or the manifestation rate of severe infections is very low. Patients returning from the Mediterranean and also from the Island of Elba and complaining of CNS symptoms should be tested for TOSV infection.

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