Low seroprevalence of sandfly fever Sicilian virus antibodies in humans, Marseille, France

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Abstract

A seroprevalence study was carried out in the region of Marseille (south-eastern France) to address the public health importance of sandfly fever Sicilian virus (SFSV) and SFSV-like viruses, as recently recognized vectors of those viruses are present in this area. The low seroprevalence rate observed in this study suggests that SFSV is not likely to be of major medical importance in the Marseille area.

Keywords: Arbovirus, Bunyaviridae, emergence, fever, phlebovirus, vector-borne

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Sandfly fever viruses (genus Phlebovirus, family Bunyaviridae) cause significant health problems in many regions of the world, including the Mediterranean basin [1,2]. In this area, most recent human cases have been caused by Toscana virus, a genotype of the species. Sandfly fever Naples virus. Sandfly fever Sicilian virus (SFSV) is a distinct arthropod-borne virus, first identified in Italy (Palermo, Sicilia) during World War II, where it affected troops of the Allied armed forces after the Sicily landings in 1943. SFSV is transmitted by sandflies during their blood feeding, specifically by Phlebotomus papatasi. The virus is spread during the warm season, i.e. the active period of the vector. SFSV infection causes relatively mild symptoms (fever, headache, and muscle and joint pain) and is not neurotropic; patients usually recover fully within a week [3].

Case reports of human cases and seroprevalence studies have suggested that SFSV, or an SFSV-like virus, circulates in Italy, Egypt, Pakistan, Iran, Cyprus, Jordan, Israel, Sudan, Tunisia, Pakistan, Egypt, Bangladesh, and Iran [2]. However, most of these studies are old, and the current situation is poorly understood. There is no documented case of SFSV infection in France. Recently, molecular evidence was reported for the presence of two distinct phleboviruses closely related to SFSV in Algeria [4] and Tunisia [5]. SFSV-like virus RNA was detected in Phlebotomus ariasi in Algeria [4,6], and in Phlebotomus perniciosus and Phlebotomus longicuspis in Tunisia [5]. Interestingly, these three species of sandfly belong to the subgenus Larrousius, and may be alternative vectors of SFSV and/or SFSV-like viruses. As P. perniciosus and P. ariasi circulate at high levels in southern France, in contrast to P. papatasi, we decided to address the public health importance of SFSV and SFSV-like viruses by conducting a seroprevalence study with sera of patients living in the Marseille region.

A total of 198 sera were randomly taken from the serum collection of the parasitology laboratory in the AP-HM Timone Hospital of Marseille. Following national regulations regarding biomedical research (Huriet-Sérusclat law), the patient’s signature at the hospital entrance office means that all specimens collected during hospitalization for diagnostic purpose are accessible for research (excluding human genetic research), without specific consent of the patient. Information on patient sex, date of birth, home location and date of hospital admission was compiled. All sera were collected from patients hospitalized between May 2009 and May 2010. All patients were living in Marseille and its suburbs. Samples were tested for SFSV IgG by indirect immunofluorescence assay, as previously described [6].

The tested population sample was composed of 101 males and 97 females, and the mean age was 47.6 years. The presence of IgG specific for SFSV or SFSV-like virus was observed in 2/198 sera (1%). Positive sera were from a 38-year-old male and a 43-year-old female (Fig. 1). This result is in agreement with previous data obtained in France more than 20 years ago. In 1969, a serological survey carried out in the south-west of France (Central Pyrenees) showed that only 2% of human sera of the region contained SFSV-specific IgG [7]. In 1987, a serosurvey performed in large wild mammals reported that 0.3% of sera reacted against SFSV in haemagglutination inhibition assays [8]. Although the presence of P. papatasi has been confirmed in the south of France, this
species is rare, in agreement with the low seroprevalence rates. Moreover, one can argue that these two patients acquired SFSV infection outside of France. One of the two positive patients could be contacted, and he reported several vacation trips to North Africa, during which infection with SFSV could have occurred, although he did not recall fever during or after the trips. As the seroprevalence rates observed with Toscana virus are much higher [9], it is important to underline that there is no cross-reactivity between Toscana virus and SFSV in immunofluorescence assays. Nevertheless, sandflies are common in the south of France, where they are known to be vectors of Toscana virus [9,10], one of the main agents of summer fever and aseptic meningitis in Mediterranean countries. SFSV-like viruses have been recently reported in sandflies other than P. papatasi in Algeria and Tunisia [4–6]. In Algeria, 5% of the tested sera contained antibodies reacting against SFSV [6]. Together, these findings raise the possibility that SFSV might be circulating significantly in south-eastern France through sandfly vectors other than P. papatasi. The present study does not support this hypothesis.

In conclusion, the low seroprevalence rates observed here for SFSV and SFSV-like viruses, together with the lack of documented cases of infection in the literature, suggest that SFSV is not likely to be of major medical importance in the Marseille area. This remains to be confirmed in other regions of France where sandflies are present.

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Transparency Declaration

Conflicts of interest: nothing to declare.

References


Molecular and immunohistochemical detection of rotavirus in urinary sediment cells of children with rotavirus gastroenteritis

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