Saint Louis Encephalitis Virus, another re-emerging arbovirus: a literature review of worldwide research

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Dear Editor,

Saint Louis encephalitis virus (SLEV) is an arbovirus member of the Japanese encephalitis virus serogroup of family Flaviviridae, isolated for the first time in 1933 in St. Louis, Missouri, USA [1]. This virus is generally transmitted by *Culex* mosquitoes as vectors and birds as hosts [2]. Most SLEV infections are silent, but clinical manifestations range from non-specific febrile syndrome to febrile headache, aseptic meningitis and encephalitis with fatality ranges from 3-30% [2].

The virus is widely distributed throughout the Americas and the Caribbean, where since 2002 is experiencing a reemergence, causing outbreaks in United States of America (USA) and Argentina, and some cases in Brazil and Peru [2, 3]. However, serological activity of the virus has been documented in Colombia, Mexico, Uruguay, Venezuela, Panama, Cuba and Trinidad & Tobago, highlighting the potential emergence of clinical SLEV infections in these and other neighbor countries, e.g. Colombia [3].

More research on SLEV is required for a better understanding of many clinical and epidemiological aspects of this arboviral disease. Herein, we looked to assess the scientific production of worldwide research on SLEV. We conducted a bibliometric study retrieving articles indexed in four bibliographical databases, PubMed/Medline (using GoPubMed), Scopus, LILACS (Latin America Literature on Health Sciences) and SciELO (Scientific Electronic Library Online). The search strategy used was "Saint Louis Encephalitis Virus" OR "SLEV". All scientific contributions were included.

The Medline search retrieved 955 articles (annual mean of 11.50±8.75 articles) with a peak of publications in 2003. USA was the highest producer (44.08%) followed by Brazil (4.08%), Argentina (3.97%), United Kingdom (1.36%) and France (0.94%) (Figure 1). The Scopus search revealed 113 documents (38.93% from USA, 25.66% from Brazil and 13.27% from Argentina). At LILACS, 36 articles were found (30.55% from Argentina, 22.22% from Brazil and 11.11% from Panama). At SciELO, 18 documents were retrieved (16 from Brazil and 2 from Argentina).

This bibliometric analysis has demonstrated the leading role that USA, Brazil and Argentina play in SLEV research. This result is probably due the fact that the virus was isolated originally in USA and for the several cases and outbreaks that have been reported in these nations. SLEV has not been

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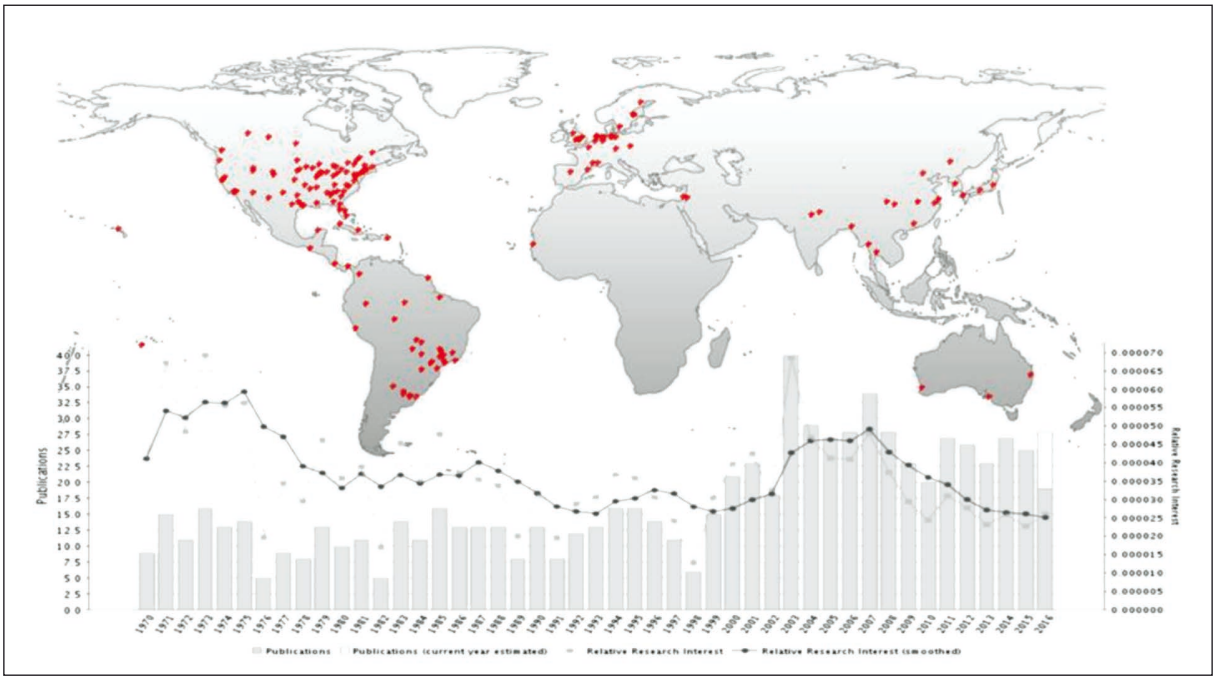

Figure 1 - Worldwide distribution and trends in time of scientific production on Saint Louis Encephalitis Virus (from GoPubMed®).

detected in Europe, however, countries such as UK and France have a small participation with genomic and immunological studies of SLEV.

The recent detection of SLEV in patients with acute febrile illness initially diagnosed as dengue indicated that during dengue outbreaks, different arboviruses, including Zika, chikungunya and Mayaro, cocirculate causing human disease [4, 5]. SLEV infection is probably not infrequent, but cases remain undiagnosed and most of the countries, where the virus and its vectors are circulating, do not have research and surveillance programs for this and other arboviruses. In addition to that, in certain areas of South America where visceral leishmaniasis account for a considerable number of cases of fever of unknown origin and unspecific symptoms, particularly when they are immunocompromised, this is differential diagnosis that should be considered [6, 7]. Leishmaniasis has been also analyzed from the bibliometrics point of view [7].

In summary, the scientific production about SLEV is low, as has been found with other emerging arboviruses, such as Chikungunya and Zika, which implies a lack of knowledge of the infection in overall [8, 9]. Although the SLEV infection is considered a neglected disease, new cases and outbreaks could appear in the Americas. As mentioned, in northern Colombia SLEV has been circulating, in horses.

In Bolivar department, for the period of March-June 2007, from 971 samples, 6.7% were positive for SLEV [10]. Thus, it is necessary the inclusion of the SLEV infection in the differential diagnosis of acute febrile illness and neurological symptoms; the implementation of active surveillance (in humans and horses), international cooperation programs and prevention policies on mosquito vectors, must to move forward to avoid introduction or dissemination of these arboviruses in the population.

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