Ten years since the last Chikungunya virus outbreak in Italy: history repeats itself

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The prevalence of Arbovirus (arthropod-borne virus) infections is increasing worldwide[1]. Recently, new clusters of autochthonous cases have been reported in countries with temperate climates where the competent vector is present[2]. This scenario represents a new threat for transfusion medicine[3,4]. The recent spread of Zika virus, new Dengue outbreaks in previously infection-naïve areas, and the stable seasonal presence of West Nile virus in Europe, teach us that the risk of virus outbreaks is never far away[5-9].

Chikungunya virus (CHIKV) is an Arbovirus, with a single-stranded RNA genome, belonging to the *Alphavirus* genus of the *Togaviridae* family, transmitted to humans by the bites of infected female mosquitoes (*Aedes aegypti* and *Aedes albopictus*). The onset of symptoms (fever frequently coupled with joint and muscle pain, headache, nausea, fatigue and rash) usually occurs between 4 and 8 days after the bite of an infected mosquito[10,11]. Severe clinical complications are very rare and most people fully recover in 3 to 10 days[12,13]. About 85% of cases are symptomatic[14], which is a higher proportion than for other Arbovirus infections.

CHIKV has been a significant public health concern in Asian and African countries, where most epidemics occurred in the 1960s and 1990s, and is newly emerging in Middle East, Pacific, American, and European countries[4].

Exactly 10 years after the first European outbreak of CHIKV, the virus has emerged again in Italy where the competent vector (*Aedes albopictus*) is present. The first outbreak was reported in the Emilia Romagna region during the summer of 2007[2,15,16] and involved the provinces of Ravenna, Forlì-Cesena, Bologna and Rimini, resulting in 217 confirmed out of 337 suspected cases. At that time, an active surveillance system including massive vector control actions and active case finding was implemented[16]. Laboratory investigations of suspected cases were performed through serology and in-house polymerase chain reaction analyses. Measures for blood safety, in the absence of an authorised CHIKV test for the biological qualification of blood components, were based on blood donation interruption in the affected areas from September to October 2007 and on a 21-day deferral for donors who stayed, even for a short time, in those areas. Furthermore, the regional blood authority in cooperation with the National Blood Centre implemented an emergency blood supply plan in order to guarantee patients' transfusion needs in the Emilia-Romagna region. When the outbreak started to decline, the measures were gradually discontinued based on risk assessment results[16]. Blood collection restarted in the affected areas when the residual risk of collecting a viraemic donation was equal to or lower than that of transfusion transmitted hepatitis B virus (1:380,000, as estimated in Italy in 2007).

In September 2017, new autochthonous cases of CHIKV infection were identified in Italy. Two different clusters occurred in two municipalities 60 kilometres apart - Anzio and Rome - in the Latium region. The identification of CHIKV cases in Rome, among family members without a history of travel to endemic countries or to Anzio, suggested an extension of the outbreak through a secondary vector-borne transmission focus.

The regional health authorities immediately started massive vector control measures in and around the affected areas, active case finding and laboratory investigations of suspected cases.

Preventive blood safety measures were immediately introduced following a risk-benefit evaluation which took into account the yearly consolidated need of red blood cells in Latium (about 30,000 units), which is supplied by other Italian regions, and the fact that the interruption of donations in the whole municipality of Rome (4 million inhabitants) would have had a massive impact on the regional blood inventory, national self-sufficiency and the local health system, and that the spread of infection (measured as the number of confirmed cases) is still relatively limited.

Therefore, the following local measures were shared with the regional health authorities and adopted in Latium: (i) interruption of blood collection in the affected local health district of the Rome municipality

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(1.3 million inhabitants) and in the municipality of Anzio (around 54,000 inhabitants); (ii) application of a 5-day quarantine for red blood cells collected from donors with a history of travel in the municipality of Anzio or in the affected district of Rome; (iii) reinforcement of donor clinical assessment; and (iv) mandatory post-donation information for donors who travelled in the affected areas and for all donors resident in the Latium region. Collection of plasma for fractionation is allowed as well as that of platelets and plasma for clinical use, provided pathogen inactivation is used.

The national measures are based on a 28-day deferral of donors who stayed, even for a short time, in the municipalities of Anzio and Rome, but collection of plasma for fractionation is allowed. Donors diagnosed with CHIKV infection are deferred for 4 weeks after the resolution of symptoms.

At the same time, the National Blood Centre activated a national emergency blood supply plan, which in the first 10 days allowed more than 2,500 red blood cell units to be sent to Latium from other Italian regions. In addition, all regions were invited to apply the national guidelines for the implementation of Patient Blood Management[17-20].

At the time of the submission of this editorial, the epidemiological investigation carried out by the regional reference laboratory for Arboviruses and the regional health authorities had confirmed 102 cases, but the investigation is still underway. Preventive blood safety measures will, therefore, be adapted on the basis of the results of the above-mentioned investigation and according to the geographical distribution of new confirmed CHIKV cases. Blood collection in the affected areas will gradually restart, based on the estimate of the residual risk of CHIKV transmission through blood transfusion, when available data show a decrease in the number of cases or as soon as a test for the biological qualification of blood components is validated and authorised.

Disclosure of conflicts of interest

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