Dengue seroprevalence and seroconversion in deploying Italian military personnel

Brunella Posteraro2, Domenico Speziale1, Rosalba Ricci1, Vito Ferrara4, Vincenzo Marvaso4, Silvia Soldini1, Patrizia Posteraro3, Maurizio Sanguinetti*, Rossella Dandolo4

1Microbiology, Fondazione Policlinico Universitario A. Gemelli - Università Cattolica del S. Cuore, Roma, Italy, 2Public Health, Fondazione Policlinico Universitario A. Gemelli - Università Cattolica del S. Cuore, Roma, Italy, 3Clinical Laboratory, Ospedale San Carlo-GVM, Roma, Italy, 4Office of Health, Centro Nazionale di Selezione e Reclutamento - Arma dei Carabinieri, Roma, Italy

Background: Dengue fever, the most common vector transmitted virus infection in humans, is endemic in more than 120 countries worldwide. Based on repeated deployments to endemic areas, the Italian Army Special Operations Command (ITASOC) members are at risk of dengue infection and, in particular, of developing serious dengue sequelae. We performed a serosurveillance of ITASOC members deployed to dengue-endemic regions to determine the magnitude of seroprevalence and seroconversion among the study cohort.

Materials/methods: We collected anonymous blood samples from personnel assigned to the highest-risk units in ITASOC between 1 February 2016 and 15 November 2017. Inclusion criteria were a deployment to a dengue-endemic region (South and Central America, Africa, and Southeast Asia; see Figure below) for 2 months or greater, and a pre-deployment serum sample within 1 year of the start date of deployment. Sera recovered from the blood samples were stored at −70°C until to be analysed. The EUROIMMUN Dengue Virus NS1 ELISA was used for the quantitative determination of anti-Dengue IgG antibodies, whereas the EUROIMMUN BIOCHIP Anti-Dengue virus indirect immunofluorescence test was used for the detection of class IgG and IgM antibodies against Dengue virus types 1, 2, 3 and 4.

Results: Of the 700 post-deployment serum samples tested, 11, or 1.6%, had the presence of anti-dengue antibodies. Members deployed to South America had the highest prevalence of dengue-specific antibodies, followed by those to Southeast Asia, Africa, and Central America. Of the 11 dengue antibody positive post-deployment samples, 1 (0.9%) lacked dengue antibodies in the paired pre-deployment sample, indicating seroconversion (infection) took place during the deployment. The overall incidence rate of dengue seroconversion was 0.01% across the entire cohort or 3.57 seroconversions per 10,000 deployment months.

Conclusions: This is the first study that describes the seroprevalence rate of dengue in Italian military personnel. We need further studies to elucidate whether these findings related to the infection and disease risk.