 

# A real threat to public health related to a potential autochthonous transmission of West Nile Virus in Poland and Central Europe

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West Nile virus is currently the only arbovirus characterized by a wide geographical distribution on all continents except Antarctica, and a tendency to rapid spreading all over the world. Infection caused by this dangerous neuroinvasive pathogen is classified as emerging infectious disease. The aims of the study were: (i) to determine potential risk factors of WNV fever in tourists travelling to tropical or Mediterranean areas, (ii) to estimate the prevalence of WNV-specific antibodies in patients returning to Poland from international travels, (ii) to demonstrate a possibility of autochthonous transmission of WNV among a Polish population, who never left the homeland. Clinical, epidemiological and immunodiagnostic examinations were performed in 88 travellers, coming back from tropical or subtropical areas. The control group consisted of 50 patients, who never travelled abroad and were frequently exposed to mosquito bites in a natural environment, especially persons performing occupational activities associated with greater exposure to insect bites (i.e. farmers, foresters, hunters, loggers, architects, geologists, ornithologists, fish farmers, veterinarians, and tour guides), as well as people who spend free time or play sports recreationally or professionally in the open space (mushrooms and berries picking, trips to the forest, river or lake, jogging in the park, canoeing, swimming, cycling, fishing, and photographing wildlife). Levels of WNV-specific antibodies in serum samples were carried out using reference immunodiagnostic West Nile DetectTM IgM Capture ELISA and West Nile DetectTM IgG ELISA (InBios International, Seattle, Washington, USA). In the study group of 88 travellers, the index values for detecting WNV-specific IgM ranged from 0.915 to 9.873 (mean 1.264±0.950), and titers for IgG reached from 0.823 to 4.193 (mean 1.243±0.644). The presence of specific antibodies against WNV was found in 6 patients returning to Poland from international journeys (6.8%), infected in Benin (n=2), Central African Republic (n=1), Madagascar (n=1), Russia (n=1), and Australia (n=1), which accounts for 68 patients per 1,000 travelling people (range: 25.4 - 142.5 per 1,000 people). The purpose of travel was pastoral and humanitarian aid (n=4) or other professional reasons (n=2). All seropositive patients were staying on long-term trips for 18 to 36 months (mean 26 months). Patients infected with WNV were travelling through rural areas or poor neighborhoods, dwelled in the tropical rain forest, areas of woody savannah, wet meadows or grasslands, stayed overnight near a river, lake, or a habitat of wild waterfowl. Clinical symptoms included fever, severe overall weakness, malaise, sweating, chills, headache and neurological abnormalities. In the control group, the presence of specific IgG to WNV was

 

found in one patient (2.0%), which accounts for 20 cases per 1,000 Polish inhabitants (range 0.5-106.5 per 1,000 inhabitants). That patient comes from rural areas of Godziesze Małe, in the municipality of Godziesze Wielkie, located in the southern part of the district of Kalisz. The WNV infected patient lives in a detached house and often observes mosquitoes near his residence. The patient deals professionally with agriculture (field crops, fruit trees) and the transportation and processing of wood. In his spare time he is interested in hunting, fishing, gathering mushrooms and the cultivation of flowers. He plays sport in the open air (jogging in the woods, cycling, swimming in fresh water). He participates frequently in trips to the forest, meadows and lake or river and walks with a pet. The patient willingly uses the services of rural tourism and takes part in open-air evening family meetings (garden, grill), during which he often gets mosquito bites. Conclusions: (1) The WNV infection was frequently diagnosed in travellers returning to Poland from missionary-humanitarian or professional long-term international journeys, especially in African countries, Australia and Russia; (2) Rapid spreading of this emerging infection indicates a necessity to include WNV in a routine differential diagnosis of patients with fever, headache and neurological signs of unknown aetiology; (3) The study data suggest a highly probable possibility of indigenous transmission of WNV on the Polish territory in persons claiming never leaving the country, particularly exposed to numerous mosquito bites in forested areas as well as having professional contact with the rural environment, sedentary and migratory wading birds.