

CHAGAS' DISEASE IN NON-ENDEMIC COUNTRIES

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Chagas' disease is an endemic protozoan disease in Central and South America. WHO designated this disease as one of the 17 neglected tropical diseases (NTDs). This is caused primarily by invasion of metacyclic trypomastigotes of the causative agent, *Trypanosoma cruzi* upon bite by the blood-sucking insect vector, triatomine bugs. In addition, transmission is caused through oral route (food-borne infection), transfusion transmission, transmission by organ transplantation and by laboratory accidents. Clinical manifestation of Chagas' disease is characterized mainly by the presence of acute, intermediate and chronic phases. The acute form develops systemic symptoms, cardiac myocarditis or encephalitis. If patients with the acute phase survived, they develop into intermediate, subacute or chronic form of Chagas' disease. The chronic phase is the primary cause for mortality due to this protozoan infection. Ninety percent of acute Chagas' disease develops chronic phase or the initial intermediate asymptomatic phase. Thirty percent of them shows chronic cardiac form of Chagas' disease, ten percent chronic digestive form. Diagnosis is usually based on serologic methods like ELISA and IFA. Chemotherapeutic agent is scanty, and only benznidazole is applied to the acute phase. Among South American countries, this disease used to be endemic in the Southern Cone countries. Recent efforts by the Southern Cone Initiative due to a variety of measures like insecticide spray and blood donor screening dramatically reduced the number of the bugs, primarily *Triatoma infestans* as well as disease incidence and prevalence around 1990 to 1995. Subsequent similar trials like the Central American Initiative and the Andean Initiative also affected the incidence and prevalence in the endemic regions. However, recent political repression or economic stagnation resulted in the significant flow of people from 17 endemic Latin American countries for Chagas' disease to developed nations. Due to this migration, irrespective of the legality, Chagas' disease has been becoming a health threat at the global level. For instance, in 2006, 3.8% of the 156,960 immigrants in Australia from 17 identified endemic countries for *T. cruzi* were likely infected with this protozoon. By 2008, Spain had accommodated 1,678,711 immigrants, illegal and legal, from the Latin American endemic countries; among these immigrants, 5.2% were supposed to be infected with *T. cruzi* and 17,390 seemed to develop

symptomatic Chagas' disease. Moreover, in Spain, majority of such Latin American immigrants were located in the city of Barcelona; from 2007 to 2009, of 766 patients at the local health center in Barcelona, 22 were diagnosed with *T. cruzi* infection by serologic procedures with the prevalence rate of 2.87%. Among these infected individuals, 21 were from Bolivia, exhibiting the prevalence rate in the Bolivian (n=127) at 16.53%. This does not seem surprising as judged from the outcomes of the Southern Cone Initiative. For instance, in 2006, of the Southern Cone countries, Bolivia showed the highest seropositives of blood donors screened, i.e., 9.90%. In the United States, they had residing Latin American immigrants of 22,843,939 in 2005, of them the number of immigrants estimated to be infected with *T. cruzi* were 300,167. The highest seropositive was demonstrated in the Bolivian immigrants at 6.75% followed by Argentina at 4.13%. Also in Japan, we had approximately 300,000 Latin American immigrants around 2005 to 2010, among whom 76.6% were from Brazil. This is primarily based on the long carrier of Japanese immigrants to Brazil and subsequent intensive communication between these two countries. Unfortunately, in Japan, blood donor screening and serologic surveillance for *T. cruzi* infection have not been extensively attempted with the same purpose as in the Western countries. In this country, Department of Tropical Medicine and Parasitology, School of Medicine, Keio University has been the center of serologic diagnosis and preliminary surveillance for Chagas' disease and demonstrated 16 from 42 suspected cases were serologically positive. Five of them had developed typical cardiac symptoms and ECG findings of this disease. If confirmed for the possibility of overt Chagas' disease, it was suggested that they had to return back to Brazil and other mother countries for treatment, as Radanil was not readily available in Japan.

As noted above, Chagas' disease has been neglected in most developed countries, which raised a variety of stigmas and misunderstandings against Latin American immigrants. Majority of the immigrants into Japan were located in Kanagawa, Nagano, Shizuoka, Aichi, Gifu, Shiga, Mie, Osaka, Okinawa and Miyagi prefectures. Because of lack in social supports such as miscommunication, absence of social insurance, etc as well as implementation of preventive measures against *T. cruzi* infection, a variety of prejudices were raised in these Japanese communities, leading to the possibility of social and human discrimination.

As recent surveillance on the geographic distribution on triatomine bugs has demonstrated they had been located worldwide. For instance, in the United States, they were already settled and became domestic in the Southern states. Also in Japan, *T. rubrofasciculata* has been detected. Urgent improvement in understanding and medical countermeasures against this disease is truly essential.