Case Study

Finding of the possible first case of oral trypanosomiasis reported in Mexico

Accepted 2nd June, 2021

ABSTRACT

Trypanosoma cruzi is a parasite frequently transmitted through vectors, nevertheless, oral transmission has been gaining relevance in the last decades. This study presents the case of a patient that spontaneously went to the Microbiology and Parasitology Laboratory of the Faculty of Medicine of the UNAM due to a clinic picture including stomach flu. Among his relevant history, attention was drawn to the fact that the patient consumes deer, opossum, and armadillo meat constantly. Regarding his pathological history, the most important fact is the presence of unspecified cardiomyopathy, on suspicion of possible chagasic heart disease. Thus the patient responded to the question if he knows about the triatomines, but he answered that he does not. Thereafter, consent was requested to make a xenodiagnosis to which he tested positive.

Key words: Trypanosoma cruzi, oral transmission, chagasic heart disease, Chagas disease.

INTRODUCTION

Trypanosomasis is a disease caused by the flagellated protozoa named Trypanosoma cruzi which is responsible for Chagas disease. The infection is mainly transmitted by triatomines from the family Reduviid, order Hemiptera and subfamily Triatomin. There are different methods of transmission of the parasite such as the presence of parasitic agents in the hematophagous triatomines feces, blood transfusion, placentalt, through the birth canal at the moment of the delivery, among others. Nonetheless, anenormous number of infections acquired through an oral way in endemic countries has been registered due to the ingestion of the feces or infected vectors in the food and drinks combined with the consumption of under cooked meat of natural reservoirs of the T. cruzi such as the armadillo (Dacypus novencintucus), rodents (Rattus novertirigicus, Neotoma sp., Peromiscus sp.), marsupials (Didelphiso possum), ferrets, bats, dogs, wild primates and cats (Velásquez-Ortiz and Ramírez, 2020; Noya et al., 2015b; Coura et al., 2014; Filigheddu et al., 2017; Sánchez and Ramírez, 2012).

Oral infections caused by T. cruzi have been gaining relevance in the last decades, reaching the tenth place out of twenty-four existing in the ranking of the most important parasites of alimentary transmission according to the Food and Agriculture Organization (FAO). Most of the cases have been reported in countries such as Argentina, Belize, Bolivia, Brazil, Chile, Colombia and Venezuela among many. Even though T. cruzi was considered to be a parasitic disease endemic to Latin-American countries, nowadays and due to multiple factors, it has been reported in several other countries outside of the region (Filigheddu et al., 2017).

The vector acquires the infection after ingestion of contaminated blood and releases trypomastigotes by depositing feces near to the bite sites of the triatomine, giving it the capacity to infect human. Thus the trypomastigotes or promastigote and replicative intracellular amastigote reach the blood stream, whereas in the vector, the parasite is only in the stages of replicative epimastigotes and metacyclicinfectious trypomastigotes. The importance of the biological cycle in the oral transmission lies in the metacyclic trypomastigote stage since the triatomine may taint the food with its feces and transmite the infection when the food travels the gastrointestinal tract, which causing higher efficiency in penetration in the gastrointestinal mucosa and a higher
presence of inoculums when compared with other methods of transmission. The latency period after the ingestion of the contaminated nourishment is between 3 and up to 30 days. Thereafter, the clinic chart is characterized by prolonged fever which can be accompanied by unspecific symptomatology or a specific one that includes acute myocarditis, acute pericarditis, acute heart failure, cardiac tamponade, pleural effusion, epigastralgia, jaundice, hematemesis, hematochezia, or hematemesis and even in some cases meningoencephalitis. These symptoms are dangerous due to the high mortality associated with each of them, being even more dangerous at young ages (Guarner, 2019; Toso et al., 2011).

On the other hand, it is estimated that patients with chronic infection spend between 10 to 30 years in an undetermined state and most of them will not present symptoms. Nevertheless, they can present clinic manifestations such as cardiomyopathy, cardiomegaly, heart failure, dyspnea, chest pain, electrocardiographic and echocardiographic abnormalities, lower limb edema and visceromegaly (Sánchez-Vega and Tay, 2017).

CASE REPORT

A 37-year-old male, born in Quechultenango and living in Tepecoacuilco, Guerrero, Mexico, has been a sawmill assistant for 20 years, but also, he has been working as a mason assistant for the last three days in Mexico City. Being in this city, he suddenly visited the Parasitology Laboratory of the Microbiology and Parasitology Department that belongs to the Faculty of Medicine of the National Autonomous University of Mexico due to a clinic picture showing an intestinal infection of 8 h evolution ever since the intake of food and drinks on public roads. The patient mentions the presence of queasiness and vomits in three occasions, accompanied with abundant liquid evacuations, without tenesmus, with suis generis color and odor, without blood or mucus. He also claimed a generalized crampy abdominal pain. The diagnosis made was for infectious gastroenteritis and medical treatment was given to him.

Among the personal history, the patient denied having any kind of chronic degenerative diseases and negative transfusion history, though he claimed that he frequently consumed fresh venison, armadillo and opossum meat. Regarding his pathological history, the patient stated of regular intake of acetylsalicylic acid under the recommendation of a doctor due to oppressive thoracic pain that sometimes spread to the neck and the left shoulder and has been persistent for over a year; diaphoresis and dyspnea on medium exertion that subsides with rest are also occasionally part of the symptoms. Apart from that, the patient stated that he has been self-medicating himself with anti-acids by reason of the presence of burning pain in the epigastrium after the ingestion of irritant and copious meals. Based on this information, the patient was suspected to have a chagasic cardiomyopathy and as a result, the directed questionnaire was made in order to introduce triatome to the patient with the purpose of determining if he had any type of contact with this vector, to which the patient denied any kind of knowledge about. After this procedure, and because of the suspicion, consent was requested to extract 1 ml of venous blood which was intraperitoneally and proportionally inoculated to 3 CD-1 female mice of 15 g of weight. A xenodiagnosis was made using three triatomines, one in an adult stage and two nymphal ones. Clinical studies were requested previously such as chest X-ray and electrocargiographic study, but the patient never did them. As a result, the patient was told to conduct these studies and return the lab when he had already done that.

Thereafter, a nymph and an adult tested positive after 9 and 12 days, respectively presenting metacyclic trypomastigotes of T. cruzi. The mice were checked every 7 days during 90 days after their inoculation using a drop of blood that was extracted from the distal side of their tails, which resulted always in a negative test.

Unfortunately, the patient did not return for his medical checkup and as a result, a search was carried out by contacting his supervisor but it was not possible to find him because he was a temporary worker.

DISCUSSION

This investigation is important because, according to the World Health Organization (WHO), Chagas disease is one of the most spread diseases in several countries with around 6 million people being infected, of which Mexico is estimated to have 1.1 million people with this parasite, with an incidence base of 0.61 and up to 0.7% of inhabitants (Secretaría de Salud, 2021).

It has been known that in recent years, and due to an alteration in the enzootic cycles, the creation of new human settlements in natural reservoirs, the migrations of many ethnic groups and the poor life conditions of these people in combination with bad hygiene have favored the spread and proliferation of triatomines which can be seen in the increase of oral trypanosomiasis cases and in the urbanization of the Chagas disease in both endemic and non-endemic countries alike. Despite being an endemic disease in Mexico, no cases of oral Chagas had been reported (Noya et al., 2015b; Ruiz-Colorado et al., 2016).

Taking into account the findings made in the laboratory, it was determined that the route of contagion was through the ingestion of meat contaminated with trypomastigotes since the patient had no knowledge about the triatomines in addition to lack of transfusion history and the risks he is exposed to due to being an inhabitant of an endemic country, the housing characteristics of where he lives, the jobs he has been doing and the cultural influence of the region, in which the consumption of T. cruzi reservoirs is
frequent (in his case of the opossum and the armadillo). The oral Chagas cases are also important to request for his feeding habits regarding traditional processed or canned foods, uncooked aliments and those exposed to the vector’s stools or the fluids of the mammal reservoirs that may represent a risk for the patient. It is also important to investigate the emergence of febrile diseases in people who have shared foods with the patient in order to establish the method of transmission involved (Filigheddu et al., 2017; Sánchez and Ramírez, 2012; Sánchez-Vega and Tay, 2017).

Even though there are a great number of molecular and immunologic studies for the detection of oral trypanosomiasis, it is not an easy diagnosis. This is due to the little knowledge about the signs and symptoms, the difficulty to make a differential diagnosis at the moment and the presence of outbreaks that are hard to foresee, such as the ones reported in Argentina and Ecuador due to the consumption of undercooked meat, or the massive outbreaks such as those ones in Brazil, Colombia and Venezuela. All these factors, when combined, contribute to a bad or biased diagnosis since the investigation only starts when the traditional spread methods have been discarded. It is important to note that oral and vector transmissions have a very different clinical picture because the first one has an abrupt start and clinical manifestations that may vary, resulting in an obstacle in determining the magnitude of the problem (Sánchez and Ramírez, 2012; Velásquez-Ortiz and Ramírez, 2020).

The WHO in conjunction with the endemic Chagas disease countries have implemented drastic measures to contain this disease, all of which focus on diminishing the factors that helps the proliferation of triatomines and therefore an increase in the infected patients. As a result of the high impact that this parasite have in population, specially in those that are more vulnerable, the educative component is a must, making emphasis on the ways they can improve their households, the natural reservoirs of the *T. cruzi* and the infectious vectors in order to decrease the risks (Filigheddu et al., 2017)

Regarding the education of the health personnel, it must be done and actions be promoted to increase the knowledge of the existence of the oral Chagas disease as well as its transmission methods, but also, urge the patients of endemic countries to be vigilant of this disease and its symptoms, such as a sudden and persistent fever, myocarditis or pericarditis (Noya et al., 2015a).

In conclusion and taking into account everything presented above, there is a possibility that this clinical report is the first reported case of oral trypanosomiasis in Mexico, given the fact that there may be other cases that have been dismissed due to a lack of knowledge about the existence of Chagas disease among the health personnel or the fact that isolated cases may appear abruptly, but the patient decides not to go to the doctor.

ACKNOWLEDGEMENTS

The authors are grateful to Mr. Benjamín Cortés Chávez and Ms. Marisela Espinosa for their contribution to the research.

REFERENCES


