v. 3, n. 66, 2023

International Journal of Health Science

GENERAL OUTLINE AND PERSPECTIVES OF CHAGASTIC HEART DISEASE IN THE STATE OF TOCANTINS

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Abstract: INTRODUCTION: Chagas disease (CD) is an anthropozoonosis caused by Trypanosoma cruzi and transmitted mainly by the kissing bug, vector insect. Nowadays, it has been considered hyperendemic in Tocantins, and must be studied more deeply. **OBJECTIVE**: To study the manifestations of Chagas heart disease in the state of Tocantins, analyzing its peculiarities in the main foci of the disease. **MATERIALS AND METHODS:** This research is a retrospective and descriptive cross-sectional study, based on a quantitative and qualitative approach. Bibliographies selected from sites such as Google Scholar, Scielo and PubMed were used, based on criteria such as the objective of the study, year and platform of publication, without the need for submission to the Ethics and Research Committee. **RESULTS AND DISCUSSION:** In the state of Tocantins, according to the health department - SES/TO - 38 cities are classified as high risk of vector transmission of CD, 69 as intermediate and 32 as low risk. In the territory there is "heredity" of chronic carriers, due to environmental changes that bring the vectors closer to the place of residence, ease of consumption of poorly processed foods in the form of powder and raw pieces or contaminated animals, representing a new epidemic threat. The evolution of CD to the cardiac form occurs in approximately 30% of chronic cases and is the main cause of death due to heart failure. There is no information about the current situation of patients with heart disease, mainly chagasic disease in the state of Tocantins. It is extremely important to fill this gap with future work. **FINAL CONSIDERATIONS:** From this point of view, it is understood that Chagas disease is a public health problem, which confirms the importance of the present study to encourage the intensification of health surveillance actions, with the purpose of improving the collection of data about it. of

the manifestations of the chronic phase of this anthropozoonosis in citizens of Tocantins.
Keywords: Chagas. Heart disease. Tocantins.

INTRODUCTION

Acute Chagas Disease has been a persistent public health challenge in Latin America for decades (MENEZES, 2021). In the Brazilian context, the state of Tocantins stands out as an area of high epidemiological relevance, during the period from 2008 to 2018, a total of 578 cases of the disease were registered (MARTINEZ et al, *2021)*. The Southeast, Capim Dourado and Cerrado Tocantins-Araguaia health regions were the ones with the highest incidence in their respective hospitals, with a predominance of male patients, with brown skin color and aged between 70 and 79 years, in addition to having a low level of schooling (MARTINEZ *et al.,* 2021).

Chagas disease (CD), also known as American trypanosomiasis, is an anthropozoonosis caused by *Trypanosoma cruzi,* a parasite first described by the Brazilian Carlos Chagas in 1909 (IGNACIO *et al,* 2022). CD can be transmitted by other routes, such as blood transfusion, organ transplantation, vertical transmission and ingestion of contaminated food (MOREIRA *et al,* 2022). Infection by this parasite can lead to different clinical stages of the disease, with acute and chronic manifestations that mainly affect the heart and digestive system (LEITE, 2019).

Furthermore, the vector *Triatoma infestans,* one of the species popularly called kissing bug, plays a crucial role in the transmission of Chagas disease (SANTOS *et al,* 2019). It is an insect vector responsible for transmitting *Trypanosoma cruzi,* the parasite that causes the disease, to people (DE SOUSA NETO, 2020). The transmission cycle occurs when the kissing bug feeds on the blood of an infected individual and then defecates near the bite site, introducing the parasite into the host's bloodstream (PINTO, 2020).

In addition, it is observed that among the public control policies, the largest portion is directed to the control of transmission by vector or even to the transfusion route, with a lesser emphasis on the control of contaminated food, resulting in transmission of Chagas disease. orally (ARAUJO *et al.,* 2019). However, this transmission route is still neglected in Brazil, which is an impasse in the face of reducing the incidence of this disease (SANTOS *et al.,* 2021).

Among the phases of the disease in question, it is worth highlighting: the acute phase and the chronic phase, which occur progressively. Chagas disease begins with an acute phase with detectable parasitemia, which is difficult to diagnose and is generally asymptomatic. (KRATZ et al., 2019). This phase is characterized by the presence of blood trypomastigotes and elevation of anti-T.cruzi IgM antibodies, and, if there are symptoms, they present as fever, anorexia, malaise and hepatosplenomegaly, which are generally classified as symptoms of infection (PACHECO LV et al, 2021).

In the chronic phase, there is an increase in anti-T.cruzi IgG antibodies and digestive and cardiac manifestations (PACHECO, LV et al, 2021). The cardiac phase, in turn, has its relevance highlighted thanks to its high prevalence, associated morbidity and mortality. This is because cardiomyocytes begin to undergo necrosis and infiltration of inflammatory cells, a process histologically characterized as chronic fibrosing myocarditis, resulting in congestive heart failure (KAWAGUCHI et al, 2019).

It is evident, therefore, that Chagas disease has its relevance at the national level, despite being neglected by the competent bodies. (MARTINS-MELO *et. al.*, 2014). Thus, analyzing the epidemiological profile of Tocantins, an endemic state of the disease,

this study aims to contribute to the scientific analysis of cases of Chagas cardiomyopathy and the magnitude of the problem that Chagas disease represents in public health.

METHODOLOGY

This research is a retrospective and descriptive cross-sectional study, based on a quantitative and qualitative approach. Information was collected from databases such as academic google, Scielo and PubMed, which include a wide range of articles. In addition to its relevance to the research, some selection criteria for carrying out the collection were analyzed, such as the purpose of the study, the year and platform of publication of each selected article.

Because it is a study developed from secondary data, publicly disclosed by the websites used as a source, the research waived acceptance by the Research Ethics Committee, according to resolution number 510/2016 of the National Health Council.

RESULTS AND DISCUSSIONS

PATHOGENESIS OF CHAGASTIC HEART DISEASE

The virulence factors of *Trypanosoma cruzi* in the acute form involve an inhibition of the host's immune response, from the anergy of T lymphocytes and polyclonal stimulation of B lymphocytes, which lead to the production of little specific antibodies for T. Cruzi. These mechanisms lead to the persistence of the protozoan and its harmful mechanisms on different tissues (Viana et al., 2021).

T. cruzi antigens and self-antigens. As the disease progresses, phenomena such as dysautonomia (due to periganglionic damage), microvascular disorders (vasculitis) and myocardial injury (myocarditis) occur, causing effects on the conduction system, in addition to congruent fibrosis (MIRANDA *et al.*, 2021; SANTOS, 2022).

As well as the manifestation stages of the disease (acute and chronic), cardiac presentations (main organ affected) follow the same pattern. Therefore, from the infestation/infiltration of the pathogenic agent, the acute inflammatory response is nonspecific and relatively fast, causing nonspecific clinical signs and symptoms, thus delaying the diagnosis and often worsening the prognosis (ORTIZ, 2019). On the other hand, concomitantly with Lopes, et al. 2021, the chronic phase, when manifested, presents complications such as cardiomegaly, cardiomyopathy, arrhythmias with thromboembolism, heart failure, fibrosis and possible sudden death.

The classic form of chronic cardiomyopathy of Chagas disease is represented by the cardiac determined form, its signs and symptoms are based on four syndromes that can present concomitantly – anginal manifestations, arrhythmias, heart failure and thromboembolism – and can also be classified in stages clinical, A, B, C and D, depending on the extent of cardiac involvement (DE SOUSA *et al.*, 2020).

In this bias, stage A is understood as an indeterminate form. Stage B, patients with no clinical signs of heart failure, but who may present alterations that suggest structural heart disease in complementary exams, these patients are further divided into two categories: B1, which corresponds to individuals who present an altered electrocardiogram, without global ventricular dysfunction at the examination, however it is possible the existence of regional contractility abnormalities on echocardiographic examination; B2, patients who manifest reduced left ventricular ejection fraction and global ventricular dysfunction (DE MORAIS *et al,* 2021).

In addition, stage C is configured as the sum of ventricular dysfunction with previous

or current symptoms of heart failure. Finally, in stage D, the patient already has symptoms of heart failure at rest, requiring more complex therapeutic treatment (DE MORAIS *et al,* 2021)

DATA ON CHAGASTIC HEART DISEASE IN TOCANTINS

It is worth mentioning that due to the lack of recent data regarding Chagas heart disease, there is a scarcity of research directed at this area. In this sense, this study will dialogue with the research carried out by Corrêa (2010), who analyzed the epidemiology of this heart disease in Tocantins.

The State of Tocantins is considered endemic for Chagas disease and, in this regard, the surveillance service of the State Department of Health (SES, 2023) works to identify regions with more susceptibility, so that it is possible to better target combat and prevention actions of the disease.

Thus, although in 2022 only one acute case of the disease was confirmed in Tocantins, the SES identified the kissing bug, the vector of the disease, in 104 of the 139 municipalities, and in 62 of them the triatomine was contaminated with the protozoan *Trypanosoma Cruzi.* Still according to the SES, 38 cities are classified as high risk of vector transmission of CD, 69 as intermediate and 32 as low risk (CORRÊA, 2010).

In addition, it was observed that in the territory of Tocantins there is "heredity" of chronic carriers, due to environmental changes that bring the vectors closer to the place of residence, ease of consumption of poorly processed foods in the form of powder and raw pieces or contaminated animals, representing a new epidemic threat through oral contamination. In 30% of the chronic cases, the evolution to the cardiac form occurred, being the main cause of mortality due to heart failure. However, there is no data on the current situation of patients with heart disease due to CD in the State of Tocantins, which reveals the need for further studies on this topic (CORRÊA, 2010).

In a study carried out in the city of Araguaína, a reference center for the treatment of chagas disease, which receives patients from several cities in the state, it was found that 40% of patients with the chronic form had increased cardiothoracic index and 75% of patients with chagas disease, valve alterations were recorded, which reveals the severity of this pathogen (CORRÊA, 2010).

CONCLUSION

In this sense, the present study highlighted the different forms of Chagas disease, emphasizing Chagas heart disease, which can develop heart failure, with an increase in the cardiothoracic index and, above all, valve alterations. Such heart disease impacts the quality of life of the affected individual, through the progression of symptoms according to the evolution of the disease. It is noteworthy that the various forms of infection are aggravating factors for this imbroglio and contribute to the endemicity of this state.

In addition, a lack of up-to-date data on Chagas heart disease in Tocantins was observed, which may reflect underreporting during the Covid-19 pandemic. Thus, the importance of this study is understood to encourage the improvement of the health surveillance system, as well as new research, with the aim of improving the collection of data regarding the peculiarities of the chronic phase of this anthropozoonosis in the state of Tocantins.

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