
PHARMACEUTICAL CARE IN THE STATE OF CEARÁ, BRAZIL: SOCIOECONOMIC AND DEMOGRAPHIC PROFILE OF PATIENTS WITH CHAGAS DISEASE ATTENDED IN A REFERRAL CENTER

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ABSTRACT

The Pharmaceutical Care Service of the Chagas Disease Research Laboratory (LPDC), in the State of Ceará, Brazil, treats patients with Chagas disease (CD), characterized as a chronic, neglected disease that requires full patient follow-up. Objective: determine the socioeconomic and demographic profile of patients with CD treated at the LPDC. A descriptive cross-sectional study was carried out, in which 507 patients were treated from January 2007 to May 2016. The variables collected were gender, age, place of birth, schooling, family income, type of health care, occupation, living conditions and habits. The profile of *Trypanosoma cruzi* infected individuals consisted of 51.1% males; mean age of 50.4 years; 26.6% were small farmers; 48.7% had not finished elementary school; 36.9% had a family income of one minimum wage; 77.7% did not have private health insurance and most of them came from rural areas. Regarding habits, 66.5% were nonsmokers and 70.0% were sedentary. Additionally, an improvement was noted in housing conditions, with most patients moving from wattle and daub huts, which were their first homes, to brick houses. We conclude that the analysis of the socioeconomic and demographic profile of patients treated at the LPDC showed that most of them come from a low socioeconomic population, where the demand for treatment has been occurring at a later age, further reinforcing the importance of the follow-up provided by the LPDC.

KEY WORDS: Chagas disease; health services research; health profile; pharmaceutical care.

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Received for publication: 24/7/2020. Reviewed: 3/11/2020. Accepted: 5/12/2020.

INTRODUCTION

Chagas disease (CD) is endemic in 21 countries, with about 8 million people infected, mainly in Latin America, where the disease remains one of the biggest public health problems, causing disability in infected individuals and more than 10,000 deaths per year (WHO, 2020). In Brazil, the estimate is 1.8 to 2.4 million infected, the majority being in the chronic phase of the disease (Silva-Filho, 2017). Due to the considerable number of infected individuals and deaths, Chagas disease is recognized by the World Health Organization as one of the 13 neglected tropical diseases (Hotez et al., 2012; Montgomery et al., 2014; Tarleton et al., 2014; WHO, 2013).

CD is an anthrozoosis caused by *Trypanosoma cruzi*, being one of the parasitic diseases most often associated with social and economic issues (WHO, 2002). Economic differences directly influence how CD is distributed socially. Across Latin America, social conditions are already historically precarious, not only in terms of housing (which favors the domiciliation of triatomines), but also in fields related to health and education, contributing to constant cycles of poverty and disease (Dias & Dias, 1979b; Dias, 1999).

The State of Ceará in Brazil has always been one of interest to researchers regarding CD. Pioneer studies by Alencar have shown high rates of human infection and triatomine capture in this region (Alencar, 1965). Recent studies have focused on the investigation of seroprevalence in municipalities such as Limoeiro do Norte and Jaguaruana (Freitas et al., 2017; Borges-Pereira et al., 2008).

Despite the decrease in vector-borne and blood-borne disease transmission, there is still a considerable prevalence of Chagas disease in endemic areas of Brazil. However, currently, there is a predominance of chronic cases caused by vector-borne infection over the past decades, resulting in the challenge of providing care to these patients in the chronic phase of the disease (Martins-Melo et al., 2014; Pereira et al., 2015).

Pharmaceutical care comprises integrated health team attitudes, ethical values, behavior, skills, commitment and co-responsibility in disease prevention, health promotion and recovery. It is the direct interaction of the pharmacist with the user, aiming at rational pharmacotherapy and the results sought (OPAS, 2002). In this context, pharmaceutical care practice has been essential in the treatment and follow-up of patients with chronic diseases, leading to therapeutic success and, consequently, improving the quality of life of these individuals (Correia et al., 2017).

From this viewpoint, the Pharmaceutical Care Service for patients with CD was created in 2005 in the State of Ceará, to offer humanized care, as well as treatment, pharmacotherapeutic and laboratory follow-up to better meet the needs of patients in the State. By offering a pioneer service of great relevance to the State, the Chagas Disease Research Laboratory (LPDC) of the

Federal University of Ceará seeks to promote follow-up before, during and after treatment with benznidazole (BZ), in addition to including care related to both pharmacotherapy and the physical and psychological well-being of patients.

A number of challenges are faced by services which offer humanized care with the purpose of continuous improvement for the user. Therefore, understanding who these patients are is of paramount importance for the development and improvement of the pharmaceutical care service. The aim of this study was to describe the socioeconomic and demographic profile of patients with Chagas disease registered in the pharmaceutical care service.

METHODS

This is a descriptive, cross-sectional, retrospective study which assessed the socioeconomic and demographic profile of patients with Chagas disease, treated with benznidazole, seen at the Pharmaceutical Care Service of the Chagas Disease Research Laboratory (LPDC) in the Department of Clinical and Toxicological Analysis at the Federal University of Ceará, from 2005 to 2016.

Patients with Chagas disease, treated at the LPDC, were previously diagnosed by the Parasitology department of the UFC's Department of Pathology and Legal Medicine, through the combination of 2 serological tests with different methodologies, such as Enzyme-Linked Immunosorbent Assay (ELISA), Indirect Hemagglutination (HAI) and Indirect Immunofluorescence (IFI), to identify anti-*Trypanosoma cruzi* antibodies in the individual's serum.

Chagas disease patients at the LPDC are treated by physicians at the Cardiology Outpatient Clinic at the Hospital Universitário Walter Cantídeo (HUWC). Benznidazole 100mg is prescribed at a dose of 5mg/kg/day, 3 times a day, for 60 days.

This study included records of patients over 18 years of age, diagnosed with CD, followed by LPDC and who underwent complete treatment with benznidazole. Patients whose records presented incomplete or illegible information were excluded from the study. 507 patients with Chagas disease were, therefore, studied.

The data were collected from each patient's medical record filed in the LPDC. For this purpose, a form was prepared to collect the following information: gender, age, place of birth, origin, schooling, family income, private health insurance, occupation, first and current household, habits (smoking and physical activity) and the presence of animals in the intradomicile and peridomicile areas, both in the first and current household.

A database was created using Excel 2010 containing the study data, which were analyzed using the Graphpad Prism software, version 5.0. The McNemar test was used to analyze housing conditions and the presence of animals in the home, while a descriptive analysis was performed for the other parameters.

The present study was approved by the Research Ethics Committee of the Federal University of Ceará (COMEPE-UFC) under registration number 543.675 on February 20, 2014, in accordance with the norms that regulate research with human beings of the National Health Council (CNS Resolution 466/12).

RESULTS

Sociodemographic aspects

The analysis of the socio-demographic characteristics showed that half patients were males (51.1%), with small scale farming as the predominant occupation (26.6%) followed by retirees (19.1%), with low levels of schooling, 67.3% of which were illiterate or had not finished Elementary School. Finally, regarding family income and private health insurance, most of the participants earned only one minimum wage (36.9%) and 77.7% of the patients did not have private health insurance.

The overall mean age of the studied subjects was 50.4 years. When the mean age of patients enrolled each year was analyzed separately, the lowest mean (38 years) was noted in the first year of operation with an increase in the mean age starting in 2011 and remaining close to 50 years up to the last studied period (2016). This trend can be demonstrated by simple linear regression, showing that the increase was statistically significant ($R^2 = 0.7740 / p = 0.0002$).

Regarding place of birth, 475 of the patients (93.7%) were from the State of Ceará, northeastern Brazil, 24 were from other states (4.7%) and eight (1.6%) did not provide this information. In relation to those born in the state of Ceará, most patients were from four municipalities: Russas (75 patients), Limoeiro do Norte (75 patients), Quixeré (61 patients) and Jaguaruana (52 patients). All these municipalities comprise the microregion of the lower Jaguaribe (countryside of Ceará in northeastern Brazil). As for patient origin, many patients (277) came from the lower Jaguaribe microregion, followed by the metropolitan region, with 114 patients coming from the city of Fortaleza, capital of the State of Ceará.

Habits

Regarding lifestyle, 54 patients (10.7%) were smokers, 115 (22.7%) ex-smokers, 337 (66.5%) had never smoked and there was no information available for one patient. As for physical exercise, 319 patients (70%) did not do any type of exercise while 130 said they did some type of physical exercise (25.6%). When the two factors were analyzed together, 34 (6.7%) patients smoked and did not practice physical exercise and 87 (17.16%) had never smoked or done any physical exercise.

Housing

To assess the changes in housing conditions (Figure 1), the first household and the current dwelling were evaluated in relation to the type of house (wattle and daub or masonry) according to the information in the patient's file. Thus, McNemar's test showed that the number of patients living in wattle and daub huts had decreased and that masonry houses currently prevail, evidencing that the predominant group of patients are those who used to live in wattle and daub huts and currently live in masonry houses ($p < 0,01$).

Regarding the presence of animals in the peridomicile and intradomicile areas, 447 (88.2%) had animals in the first household and 299 (59%) currently have animals. Figure 2 shows that the group of individuals who had animals in their first dwelling and still have them in the current one is greater than the other groups, with a statistical difference between them ($p < 0.01$).

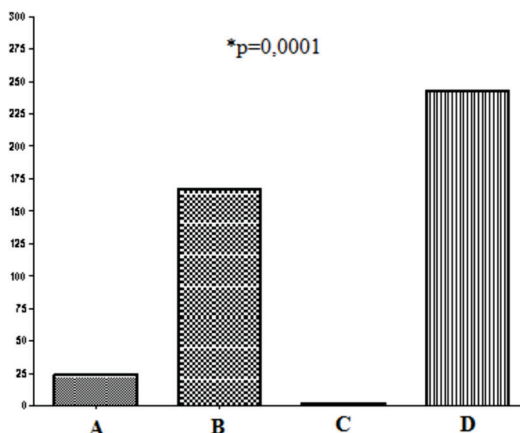


Figure 1. Comparison between the first and current dwelling regarding the type of construction (dry mud or brick) of patients with chronic Chagas Disease followed in the LPDC from 2005 to 2016.

Subtitle:

A – Patients that lived in a dry mud house and still do.

B – Patients that lived in a brick house and still do.

C – Patients that lived in a brick house and currently live in a dry mud one.

D – Patients that lived in a dry mud house and currently live in a brick one.

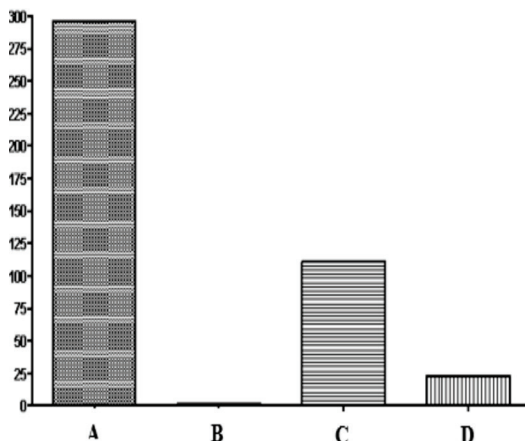


Figure 2. Comparison between the first and current dwelling regarding the presence of animals in the homes of patients with chronic Chagas Disease followed in the LPDC from 2005 to 2016.

Subtitle:

A – Patients that had animals in the first house and still do in the current one.

B – Patients that did not have animals in the first house and now do in the current one.

C – Patients that had animals in the first house and do not have animals in the current one.

D – Patients that never had animals at home.

DISCUSSION

The Patient Pharmaceutical Care Service developed by LPDC is unique in the entire State of Ceará, dispensing etiological treatment and monitoring a large number of CD patients from the entire State. To demonstrate its importance, in 2012 the Health Secretariat of the State of Ceará (SESA) announced that it had supplied benznidazole (BZ) to 152 patients in the State, of which 70 (46%) were treated by the LPDC. Additionally, the State demand for the drug in the same year was 29,103 BZ tablets, of which 47.1% were supplied by the LPDC (Ceará, 2012).

As for the overall mean age of 50.4 years, most studies indicate a similar mean, over 50 years of age. Carvalho et al. (2013) found a mean of 56 years in patients treated at the Infectious Diseases Outpatient Clinic of the Couto Maia Hospital. Another study by Mota et al. (2006) found a mean age of 55.2 years in participants enrolled in the Chagas Disease Laboratory of the State University of Maringá (Mota et al., 2006).

When analyzing the mean age by calendar year, there was a statistically significant increase in mean age, showing that patients are seeking treatment at health services later in life. This may be partly explained by the possible late discovery of the disease, due to the lack of symptomatic and chronic behavior. Moreover, the literature has shown a considerable decrease in infection rates, as well as in the mortality rate for CD, leading to the resulting aging of patients. This fact is in line with the improvements in social conditions and better monitoring of these patients, which increases life expectancy (Martins-Melo et al., 2014; Dias, 2002; Guariento et al., 2009).

All these data corroborate the increasing profile of individuals over the age of 50 described in the present study, providing the Service with the challenge of dealing not only with CD directly, but with other common comorbidities that affect this population, in addition to providing an effective pharmacotherapeutic follow-up, when considering polypharmacy.

Thus, the high prevalence of retirees is consistent with the profile of patients due to their higher age, or to early retirement due to health impairment caused by late complications of Chagas disease (Oliveira et al., 2010).

Regarding the gender variable, there was no significant difference between men and women. Carvalho et al. showed a predominance of men, with a prevalence of 53.6% of male patients in their study.

As for schooling, most patients had not finished elementary school or were illiterate. In this context, several studies corroborate this, such as the study by Costa et al. (2007), which showed a prevalence of 58.4% illiterate patients in Mossoró, State of Rio Grande do Norte, Brazil. A similar profile was also observed by Oliveira et al. (2006) in a study carried out in the municipality of Montes Claros, State of Minas Gerais, Brazil, which showed that 27.9% of the patients were illiterate and 68.6% had not finished elementary school. This high rate of patients with deficient schooling is probably due to the fact that these patients had few social opportunities, low salaries and came from families with low socioeconomic status and schooling (Zicker, 1988).

The most prevalent occupations were: smallscale farmer, followed by retired individuals and homemakers. The predominant family income was one minimum wage. This high number of small farmers can be explained by the fact that most individuals were from the countryside of the State of Ceará, where agricultural activities are prevalent. A study carried out by Costa et al. (2007) showed that 83.3% of the infected individuals interviewed for the study earned less than two minimum wages monthly, of which 33.3% stated that the only source of income came from small family farms while 20.8% were retired. Carvalho et al. (2013) found a similar result, in which 87.5% of the infected individuals received less than two minimum wages monthly, with small farming being the main source of income, thus corroborating the profile found in the present study.

Regarding both place of birth and origin of the patients studied, the municipality of Jaguaruana and the microregion of the Low Jaguaribe are predominant, mainly the municipalities of Limoeiro do Norte, Russas and Quixeré. Alencar (1965), the pioneer in conducting studies in these municipalities, evaluated *Trypanosoma cruzi* positivity in animal reservoirs of the domestic cycle of CD, detecting a positivity rate of 24.4% in Russas and 29% in Limoeiro do Norte. More recent studies found a seroprevalence of 4.2% (34/812) in the population of Limoeiro do Norte (Freitas et al., 2017), whereas another study carried out in four rural areas in the municipality of Jaguaruana, Ceará, in 2002, showed a seroprevalence for chagasic infection in 3.1% of the population (Borges-Pereira et al., 2008).

Therefore, these data show that this region of Ceará still has a number of infected individuals, and special efforts should be made to perform an active screening of patients that have not yet been diagnosed in the region. Based on this information, the LPDC also performs active screening for new cases in these regions of Ceará, which could justify the large number of patients coming from these areas.

Another important aspect to be mentioned is the significant number of patients from the capital city of Fortaleza, compared to the small number of individuals effectively born in the capital, which shows there was a rural exodus, where the patients migrated from the countryside to Fortaleza. This can be explained by the development of urbanizing policies in recent decades, as well as the lack of adequate conditions in rural areas, which may have attracted some of these individuals to large urban areas (Dias et al., 1991). It is worth emphasizing the described phenomenon of “Chagas disease urbanization” (Dias & Dias, 1979a), in which the disease occurred through vector infection in endemic areas and the subsequent migration of infected individuals to urban areas (Coura & Dias, 2009).

When patients were asked whether or not they had private health insurance, most of them said they did not, which corroborates the fact that most of the patients in the present study have very low family income, and therefore, these patients are predominantly treated by the Brazilian Unified Public Health Service (SUS).

As for habits, our findings showed that most patients were sedentary. It is known that changes in eating habits, as well as a sedentary lifestyle, contribute to the growing epidemic of chronic diseases such as obesity, diabetes mellitus and arterial hypertension, conditions that frequently develop alongside lipid alterations, hypercoagulability and increased risk of cardiovascular diseases (Burke & Bell, 2000). Therefore, patients with CD may also be affected by atherosclerotic diseases, further increasing cardiovascular risk, morbidity and mortality.

Studies on housing conditions showing risk of vector infection have been carried out by many researchers. Dias (1986) warned that good household sanitation and a clean environment, with no cracks in the walls and other hiding places, surrounded by an organized and hygienic peridomicile, practically prevented triatomines from having a place to hide (Dias, 1986). Thus, masonry houses without a plastered interior and mainly wattle and daub huts are significantly more infested by the vector than those made of masonry with plastered inner walls (Pessoa & Martins, 1982). Additionally, it is important to evaluate the physical conditions of the house, such as the presence or absence of house annexes and food sources when vector species are found in the household (SNVS, 2005). The presence of animals in peridomicile and intradomicile areas can function as food sources for the triatomines, as demonstrated in the study by Silva et al. (2010), where the positivity for triatomines was higher in chicken coops (36.4%), followed by pigpens (18.2%), barns (15.1%) and stables (12.1%), indicating that the presence of these animals attracted the triatomines to the households (Silva et al., 2010).

In this context, most of the assessed patients declared that their first household was a wattle and daub hut and there were animals in the intradomicile and peridomicile areas, different from their present households that are mostly masonry houses, but they still have animals outside the residence. This shows there has been a considerable improvement in housing conditions; however, even though the current number of wattle and daub huts is low, it is a matter of concern that there are still people living under these conditions to date.

As for the presence of animals in the household (peridomicile and intradomicile areas), there was a decrease in the presence of animals when comparing the first domicile with the current dwelling, yet in both cases, most patients coexist with animals, and as previously discussed, this fact can attract triatomines and thus contribute the domestic cycle of the disease.

The present study showed, therefore, that the profile of the population with CD, treated in the Pharmaceutical Care Service of the LPDC, was characterized by older individuals with low income and schooling, who presented housing improvement. Migrations to urban centers was also verified and some habits were adopted, mainly a sedentary lifestyle, increasing the future risk of new cardiovascular diseases.

Finally, it is worth mentioning that the large number of patients evaluated in the present study, shows the relevance and scope that this service presents to the state of Ceará, enabling patients with CD to receive comprehensive care, improving their quality of life. In addition to the pharmacist, other health professionals are also part of the Pharmaceutical Care Service, such as physicians prescribing pharmacotherapy, nutritionists who prescribe food diets, and others, who contribute and strengthen the multidisciplinary of the service in the health care of patients with Chagas disease.

The limitations of the study were due to the fact that some patient files presented incomplete or illegible information, leading to the exclusion of these individuals.

CONFLICT OF INTEREST

The authors inform that there is no conflict of interest.

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