

# PROFESSIONAL CONDUCT AND KNOWLEDGE GAPS CONCERNING CHAGAS DISEASE IN INTERRUPTED VECTOR-BORNE TRANSMISSION AREA

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**ABSTRACT:** Aiming to verify gaps in the conduct and knowledge of health professionals concerning Chagas disease in Maringá and Paçandu, Paraná State, Brazil, from September/2004 to July/2005. The participants were chosen by systematic sampling. A total of 487 professionals, consisting of 75 physicians, 75 nurses, 150 nursing assistants and 187 community health agents (CHA), were interviewed using two semi-structured questionnaires, one created for the physicians and another for the nurses, nursing assistants and health agents. A considerable percentage of professionals from all categories demonstrated doubts about treatment, mechanisms of transmission, recognition of the triatomines and the sending of official notification of the presence of insects, tests for diagnosis confirmation, etiologic treatment, and the prognosis of the disease. Doubts arose more frequently among the CHA, who are the main link between patients and basic health units. In order to maintain the current state of disease control and provide appropriate treatment for those already infected by *Trypanosoma cruzi*, it is necessary to invest in epidemiological surveillance, education and to have duly capable and qualified health professionals.

**KEYWORDS:** Chagas disease; Epidemiological surveillance; Health education; Professional conduct.

## CONDUTA PROFISSIONAL E LACUNAS DE CONHECIMENTO SOBRE DOENÇA DE CHAGAS EM ÁREA DE TRANSMISSÃO POR VETORES INTERROMPIDA

**RESUMO:** Objetivando verificar diferenças no comportamento e conhecimento dos profissionais de saúde sobre a doença de Chagas em Maringá e Paçandu, Paraná, Brasil, de setembro/2004 à julho/2005, participantes foram escolhidos por amostragem sistemática. Um total de 487 profissionais, sendo 75 médicos, 75 enfermeiros, 150 auxiliares de enfermagem e 187 agentes comunitários de saúde (ACS), foram entrevistados por meio de dois questionários semi-estruturados, que foi criado para os médicos e outro para os enfermeiros, auxiliares de enfermagem e agentes de saúde. Uma porcentagem considerável de profissionais de todas as categorias demonstrou dúvidas sobre tratamento, reconhecimento de mecanismos de transmissão, triatomíneos e envio da notificação oficial da presença de insetos, testes para confirmação do diagnóstico, tratamento etiológico, e prognóstico da doença. Além disso, surgiram dúvidas mais frequentes entre os ACS, que são o principal elo entre pacientes e unidades básicas de saúde. A fim de manter o estado atual de controle da doença, e oferecer tratamento adequado para aqueles já infectados pelo *Trypanosoma cruzi*, é necessário investir na vigilância epidemiológica, educação e ter profissionais de saúde devidamente capacitados e qualificados.

**PALAVRAS-CHAVE:** Doença de Chagas; Vigilância epidemiológica; Educação em saúde; Conduta profissional.

### Introduction

In Brazil, the control of the vector-borne transmission of Chagas disease began in the 1970s and was intensified by the National Health Foundation (Fundação Nacional de Saúde - FUNASA) in the 1980s, whose actions were proven to be effective against domiciliary triatomine species (DIAS et al., 2002). In 1991, the health ministries of the countries of Latin America proposed a shared regional initiative with the objectives of eliminating *Triatoma infestans* and controlling the transfusional transmission of

*Trypanosoma cruzi* (BRASIL, 2006). In 1994, 80% of the endemic area of Brazil was under surveillance, with home infestation rates below 5% (DIAS, 1994). From 1998, evaluations of home infestation rates by state were initiated, and it was confirmed in 2005 that Paraná had achieved the interruption of vector-borne transmission of the disease (BRASIL, 2006). In June 2006, the Brazilian Ministry of Health stated that the country was ready to receive the international certificate of interruption of vectorial transmission of Chagas disease by *T. infestans* (BRASIL, 2006). This interruption was directly reflected in reductions

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in transfusional and congenital transmissions (DIAS; COURA, 1997; DIAS et al., 2002). This shows that in the current situation, Brazil is, basically, engaged in measures of epidemiological surveillance and blood bank control (ORGANIZACION PANAMERICANA DE LA SALUD, 2004; BRASIL, 2006).

With the interruption of vector-borne transmission, episodes of small and limited outbreaks due to oral contamination have started to become important in the context of public health (STEIDEL et al., 2005; ZAPATA et al., 2005; ROJAS et al., 2005; DIAS 2006; DIAS et al., 2007; GALLIEZ et al., 2007; CRESPO et al., 2007). In the sylvatic transmission cycle, this is the normal form of transmission, and represents the manner in which the parasite circulates in nature, thereby avoiding vectorial and transfusional control measures (STEIDEL et al., 2005; DIAS, 2006).

Along with epidemiological surveillance, the other great challenge is to provide adequate medical treatment to infected patients. In Brazil, there are 1.9 million infected individuals that depend on appropriate medical assistance from the National Health Service (Sistema Único de Saúde – SUS), the majority of which are people with low incomes, who often migrate into different parts of the country (GONTIJO et al., 1996; DIAS; COURA, 1997; SABINO et al., 2003).

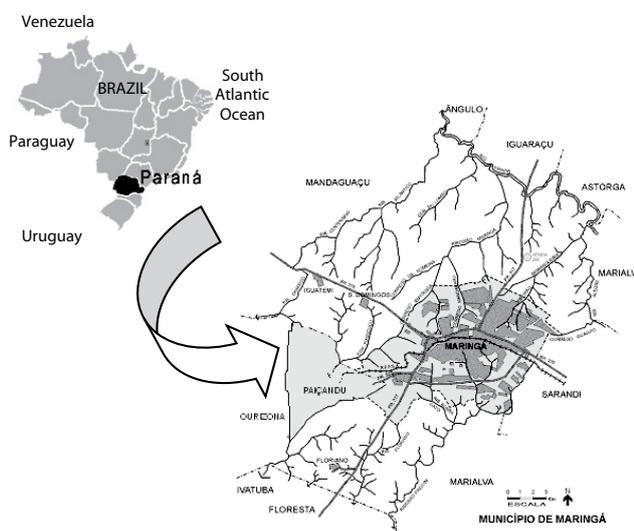
The sustainability of the control of Chagas disease, as well as the measures already adopted, relies on the maintenance of the availability of resources and on the politics of intervention, which includes full care for communities in which there are still patients with Chagas disease. Such attention requires adequate education of health professionals, at all levels of care, with regard to epidemiology, diagnosis, treatment and guidance (DIAS; COURA, 1997). For this reason, it is necessary to maintain basic knowledge about the disease among health professionals, including those that work in the Primary Health Units (PHU), and to continually update the operational knowledge and the information of how to manage individuals with positive serology for *T. cruzi*. In the light of this situation, the objective of this paper was to verify the gaps in the professional conduct and knowledge concerning Chagas disease in area of interrupted vector-borne transmission, in Brazil.

## Material and Methods

This project received approval by the Permanent Committee of Ethics in Research with Human Beings – Copep/UEM (Register 177/2003; Assessment No. 131/2003) and of the Health Offices of the municipalities of Maringá and Paçandu.

Four hundred and eighty-seven primary care

health professionals of the public health system who attended patients with positive serology for Chagas disease from September 2004 to July 2005 in the municipalities of Maringá and Paçandu, northwest of the State of Paraná (Figure 1), participated in this study.



SCALE – MUNICIPALITY OF MARINGÁ

**Figure 1:** Map of Brazil locating the State of Paraná, and the municipalities of Maringá and Paçandu, where the study was carried out.

Interviews were carried out with 75 physicians (cardiologists, general practitioners and doctors from the Family Health Program (FHP), 75 nurses, 150 auxiliary nurses and 187 Community Health Agents (CHA). All of the Primary Health Units (PHU) of the municipalities was included in the study, with five of them belonging to Paçandu and 23 to Maringá.

In Paçandu, all of the 48 professionals from above-mentioned classes were enrolled in the study. In Maringá, 439 professions, who made up a sample calculated by category using the program EPI-INFO 2002 – version 6.0, were interviewed. The expected frequency factor was 50%, the error acceptability was 55% and the confidence level was 95%. The sample elements were obtained by systematic sampling (RODRIGUES, 2002).

Data was collected through interviews using one of two semi-structured questionnaires: one which was created for the physicians and another for the nurses, auxiliary nurses and CHAs, composed of 16 and 11 questions, respectively. The questions dealt with the following topics: the transmission mechanism, diagnosis and clinical treatment, care of and guidance given to Chagas disease patients, and the evolution and prognosis of the disease. Each professional was interviewed individually, by a single researcher, in the PHU corresponding to the area in which they worked. They all signed a free and informed term of consent for the use of their responses,

in accordance to the recommendations of the Copep/UEM and of the Health Offices of both the municipalities.

Descriptive statistics, expressed in terms of the frequency and percentages, were used to present the data.

## Results

Among the physicians, 69% reported attending Chagas disease patients on a regular basis, with 45% of them attending at least one Chagas disease patient every two months. For 79% of the physicians, the majority of these patients sought medical assistance for complaints not directly related to Chagas disease. Patients seeking assistance for Chagas disease-related complaints were only occasionally attended. Actually, the majority of patient looks at health service suffering others pains and in the process of investigation of these complaints they faces with the positive diagnose to *T. cruzi* infection. Therefore, the complaints related to Chagas disease are not that leads to the demand of health services.

When inquired on the main mechanisms of Chagas disease contamination, 98% and 79% of the physicians answered that were vector-borne transmission and transfusional transmission, respectively. Knowledge about congenital transmission was reported by 21%. Vector-borne transmission was believed to be the principal transmission mechanism in the State of Paraná by 80% of the physicians.

The conduct of 66% of the physicians when faced with a patient with suspected infection by *T. cruzi* (that is, to solicit a serological diagnosis of the infection and, independent of the existence of symptoms, a radiograph of the thorax and an electrocardiogram) was considered adequate. However, the majority of the physicians (96%) stated that they would solicit a Machado-Guerreiro reaction test to confirm the serological diagnosis. Only a small percentage stated that they would request indirect immunofluorescence–IIF (28.8%), indirect haemagglutination – IHA (20.6%), ELISA reactions (13.7%), xenodiagnostic (9.6%) and haemoculture tests (9.6%) (Table 1).

**Table 1:** Techniques solicited for the diagnosis of Chagas disease by physicians in the public health services of the municipalities of Paiçandu and Maringá/PR

Serological reaction	Number of physicians	Percentage (%)
Machado-Guerreiro	70	95.9
IIF	21	28.8
IHA	15	20.6
ELISA	10	13.7
Hemoculture	7	9.6
Xenodiagnosis	7	9.6

The symptomatology of the acute and chronic phases of Chagas disease was correctly described by 51% and 65% of the physicians, respectively. With regard to etiological treatment, 69% did not know about the existence of benzonidazole and only 16% prescribed this medication. Forty-six percent of the physicians could state the main side effects of

the medication, but only 16% expressed an opinion about them, most frequently relating to its toxicity and failure of the patient in following the treatment program due to the side effects. The prognosis of patients infected by *T. cruzi* was considered varying from without alteration to very bad by 71% of the physicians (Table 2).

**Table 2:** Opinions of professional physicians, nurses, auxiliary nurses and community health agents (CHA) from the municipalities of Maringá and Paiçandu/PR about the prognosis of chagasic patients.

Professional	Total number of inter-views	Prognosis (%)				
		very good	good	Without alterations	bad	Very bad
Physicians	73	2.7	26.0	42.5	26.0	2.7
Nurses	73	2.7	17.8	38.4	32.9	8.2
Auxiliary nurses	147	0.7	12.2	33.3	32.7	21.1
CHAs	187	1.6	17.1	33.2	23.0	25.06

The majority of nurses, auxiliary nurses and CHAs stated that they knew how the transmission of the disease occurred. However, only a small percent-

age (22.4%) responded correctly when asked about the main mechanisms of transmission, including those in the State of Paraná (Table 3).

**Table 3:** Knowledge of professional nurses, auxiliary nurses and community health agents (CHA) from the public health system about the transmission of Chagas disease.

Professional	Stated that they knew how Chagas disease is transmitted N° (%)		Knew the transmission mechanisms of Chagas disease N° (%)		Knew the main transmission mechanism of the disease in the Paraná state N° (%)	
	Maringá	Paiçandu	Maringá	Paiçandu	Maringá	Paiçandu
Nurses	68 (100)	5 (100)	4 (5.8)	1 (20)	18 (26)	2 (40)
Auxiliary nurses	128 (100)	18 (94.7)	1 (0.8)	3 (15.8)	26 (20.3)	4 (21.1)
CHAs	167 (97)	13 (86.7)	6 (3.5)	2 (13.3)	38 (22.1)	3 (20)

Also, the majority of nurses (84%), auxiliary nurses (65%) and CHAs (57%) stated that they could recognize the triatomines. However, only 27%, 14% and 12% of these professionals, respectively, were able to identify them with certainty when the different species of triatomines were presented to them. The correct responses were given mainly by the professionals from Paiçandu that lived, or had previously lived, in rural residences in the region and had had contact with the vector inside their homes (see Appendix). Conversely, in Maringá, where many of the professionals thought that Chagas disease was no longer a significant threat, they were less able to identify the triatomines. The main response from the professionals of these three categories that did not know how to identify the vector was that they would seek help from a colleague or direct the patient to another PHU.

When faced with the situation of attending a patient with a confirmed or suspected diagnosis of Chagas disease, 81% of the nurses, 70% of the auxiliary nurses and 66% of the CHAs adopted the correct conduct, sending the patient for a consultation with a general practitioner. With regard to the prognosis of the patient infected by *T. cruzi*, 79% of the nurses, 87% of the auxiliary nurses and 81% of the CHAs considered it varying from without alteration to very bad (Table 2).

## Discussion

With the progress made by the Chagas disease transmission control program in all endemic areas in Brazil and the interruption of the vector-borne transmission of the parasite (DIAS 2000, 2001; DIAS et al., 2002) today, efforts concentrate on the maintenance of effective epidemiological surveillance and on attention to the health of patients already infected by

*T. cruzi* (ORGANIZACIÓN PANAMERICANA DE LA SALUD, 2004). In the present study, the majority of physicians reported frequently attending patients with positive serology for Chagas disease, despite the fact that these patients sought treatment from the health system for other complaints. This information demonstrates the existence of professional knowledge and conduct gaps, standing out the importance of health professionals keeping themselves up to date with current knowledge about Chagas disease, even in countries where vector-borne transmission is under control. Care relating to chronic cases of Chagas disease and the ability to carry out a swift diagnosis in occasional acute cases should be the present preoccupation of the health system, independent of the initial reported complaint (ARAÚJO et al., 2004; ROJAS et al., 2005; STEINDEL et al., 2005; DIAS et al., 2007; GALLIEZ et al., 2007).

When faced with a patient with suspected infection by *T. cruzi*, the majority of physicians solicit confirmation of the diagnosis, although they choose to use the Machado-Guerreiro reaction. This is another gap once the technique is now obsolete due to its low sensitivity, the lack of standardization in the antigens used (RIBEIRO et al., 1998) and of reproducibility (BRASIL, 2005). Diagnosis during the chronic phase of Chagas disease is essentially serological, and should be carried out using a test with high sensitivity, just like ELISA with total antigen or IIF, in conjunction with another test of high specificity, such as IHA, IIF and ELISA, which are able to determine the diagnosis in virtually 100% of cases (BRASIL, 2005).

The data obtained in this study reveal that the majority of physicians do not know about the existence of benzonidazole and its side effects, in addition to 12% of them stating that no etiological treatment exists for Chagas disease. In Brazil, ben-

zimidazole is the only medicine available for this parasitosis (BRASIL, 2005). Although it does not show absolute efficiency, this medicine can improve the prognosis of the patient, increasing survival rates and stabilizing the evolution of the infection (VIOTTI et al., 1994). The earlier the etiological treatment begins, the better the results, despite the significant side effects, which for the majority of cases are responsible for the abandonment of treatment (RIBEIRO et al., 1998; CANÇADO, 2002). According to Cançado (2002), the disease is cured in 76% of acute patients and in 8% of chronically treated patients.

The symptomatology of the acute phase was incorrectly described by almost half of the medical professionals. This is of concern in examples of outbreaks of *T. cruzi* infection related to the consumption of contaminated sugarcane juice, like the case in Navegantes – State of Santa Catarina (STEINDEL et al., 2005) that occurred in March 2005. Initial difficulties were encountered in diagnosing the patients due to a lack of agility/efficiency among the health professionals in the region involved, resulting in three deaths.

In this study, it was found that nurses, auxiliary nurses and CHAs demonstrated insufficient knowledge with regard to the transmission mechanisms of Chagas disease and, further, that the majority of these professionals could not identify the vector of the disease with certainty. Among Latin American countries, Brazil has managed to achieve good results in the control of vector-borne transmission for this disease (SCHMUNIS; DIAS, 2000; SILVEIRA, 2000). It has registered a progressive reduction in chagasic infection among blood donors and effectiveness in avoiding possible infected donors (DIAS; SCHOFIELD, 1988). The risks of congenital transmission have been reduced (DIAS; COURA, 1997) by the decrease in the number of women of fertile age with the disease. To maintain control of the vector-borne transmission of Chagas disease in Brazil, the population and health professionals in risk areas need to mount an engaged and efficient epidemiological surveillance, which means political and social maturity.

In a recent study Guilherme et al., (2002), researchers found that professionals from the PHUs of six municipalities in the Northwest of Paraná did not know the procedures to be followed when they received reports that triatomines had been encountered, or the appropriate guidance to be given to the patients. For the majority of the nurses, auxiliary nurses and CHAs, the prognosis of Chagas disease varied from normal to very bad, which lead to incorrect and alarmist guidance, such as the quote: “the patient should be advised to visit a doctor when there are symptoms, as it is a non-curable disease...” However, approxi-

mately 60% of patients in the country are found to have the indeterminate form of Chagas disease (RIBEIRO et al., 1998), without symptomatology and with a similar prognosis to that of the population in general (BRASIL, 2005).

The need to update these professionals to enable them to better attend patients and the needs of the PHUs is therefore clear. According to Ferreira et al., (2007), one of the main challenges to be faced in Brazil, in the coming years, is the medical and social attention that needs to be paid to the great numbers of people that suffer from the disease.

Patients with the indeterminate form of the disease should be given preferential treatment by the primary health services (DIAS; COURA, 1997). The professionals operating at this level are responsible for giving correct explanations with regard to the benignity of the patient’s clinical condition and the need to follow it up in the PHUs (BRASIL, 2005). However, often, due to the lack of correct guidance, many patients without symptomatology progress to specialist-level treatment, thereby unnecessarily burdening the health system (BOZELLI et al., 2006).

The CHAs were the professionals that had the most doubts about Chagas disease, in all aspects involved with it, and the least dedication to and pre-occupation with the function that they performed. This may be related to their lack of qualification, to their temporary work contracts and to their low salary. This is of concern, as the PHU is the first port of call for patients wanting to use the health system, and the CHA is the protagonist of primary care. This professional is the main connecting link between the patient and access to health care because they generally live in the community in which they perform their work and they experience fully the problems of that community (BEZZERRA et al., 2005).

The knowledge and attitude of health professional with regard to the treatment of individuals infected by *T. cruzi* cannot be dismissed. The control of the transmission of *T. cruzi* does not guarantee that new cases of chagasic infection will not occur. Recently, two cases of *T. cruzi* infection in children resident in the State of Paraná were reported (ARAÚJO et al., 2004). Newspapers have also been frequently notified about small outbreaks of oral *T. cruzi* infection in the Amazon, confirmed by the Health Ministry (BRASIL, 2006).

## Conclusion

Information is an essential instrument in the efficient functioning of the health service, in order to create staff that are technically prepared and dedicated to the whole process of patient care, from diagnosis to treatment and correct guidance, when

necessary.

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