



Communication/Comunicação

Occurrence of 102 cases of paracoccidioidomycosis in 18 months in the Itaipu Lake region, Western Paraná

Ocorrência de 102 casos de paracoccidioidomicose em 18 meses na região do Lago de Itaipu, Oeste do Paraná

Eduardo Alexandre Loth¹, Solange Venturini de Castro², Joseane Rodrigues da Silva¹ and Rinaldo Ferreira Gandra³

ABSTRACT

Introduction: The study investigated the incidence of disease and death events among patients with paracoccidioidomycosis who were residents in the Itaipu Lake region from 2008 to 2009. **Methods:** A review of patient records was conducted at the Department of Tuberculosis of the Epidemiology Center of the City of Foz do Iguaçu, Paraná. **Results:** The results identified 102 new cases of paracoccidioidomycosis in the period described, 72 men and 30 women, and 15 deaths were recorded during the study. **Conclusions:** It can be concluded that the Itaipu Lake region is an endemic region.

Keywords: Paracoccidioidomycosis. *Paracoccidioides brasiliensis*. Itaipu Lake.

RESUMO

Introdução: O estudo investigou a incidência da doença e eventos de morte entre os portadores de paracoccidioidomicose residentes na região do Lago de Itaipu, no período de 2008 a 2009. **Métodos:** Foi realizado levantamento em registros de pacientes do Setor de Tuberculose do Centro de Epidemiologia da Cidade de Foz do Iguaçu, Paraná, entre o período de janeiro de 2008 e julho de 2009. **Resultados:** Os resultados apontam 102 novos casos de paracoccidioidomicose, 72 homens e 30 mulheres, foram registrados 15 óbitos durante o estudo. **Conclusões:** Conclui-se que a região do Lago de Itaipu é uma região endêmica.

Palavras-chaves: Paracoccidioidomicose. *Paracoccidioides brasiliensis*. Lago de Itaipu.

Paracoccidioidomycosis (PCM) is a systemic mycosis caused by the dimorphic fungus *Paracoccidioides brasiliensis*, is considered the most important fungal infection in Latin America and 80% of cases of the disease occur in Brazil¹.

In 2001, estimates showed that throughout South America, around 10 million people were infected². Most cases of PCM occur in males of working age. The organs most often affected by PCM are the lungs³.

Infection occurs primarily through accidental inhalation of the pathogen by the host, which primarily infects the lungs and may spread throughout the body, causing damage to internal organs and mucocutaneous lesions⁴. This mycosis is characterized as highly relevant to public health, its clinical manifestations result in irreversible physical disabilities that incapacitate the individual, usually in their most productive years⁵.

The aim of this study was to investigate the incidence of PCM in residents of the Itaipu Lake region from 2008 to 2009.

After approval by the Research Ethics Committee of the State University of Western Paraná (UNIOESTE), the study was conducted at the Tuberculosis Division of the Epidemiological Surveillance Center in Foz do Iguaçu, Paraná, which receives public healthcare patients from the Itaipu Lake microregion, including residents of Paraguay and Argentina. Biweekly, information regarding the number of cases, sex, age, housing, disease history and outcomes of the cases were investigated in patient records.

Data analysis was performed using *EpiInfo* software in Windows 2000® platform, using simple descriptive statistics to calculate the index of relative risk of death event between sexes of the sample and their death rates per inhabitants of Itaipu Lake population region⁶.

The results showed 102 new cases of PCM in the period studied. Of these, 29.4% (30/102) were women and 70.6% (72/102) were men. The males showed a proportion of 2.4:1 in relation to women. The mean age presented by the study sample was 49.1 ± 15.5 years-old, the minimum and maximum age identified was 18 and 81 years-old, respectively. Observation verified that the most affected age group was between 30 and 49 years-old, with 53% (54/102) of the total sample, followed by the age group over 50 years-old and below 30 years-old, 38.2% (39/102) and 8.8% (9/102), respectively.

Observation confirmed that 52% (53/102) of the records reported pathologies associated with PCM and tuberculosis was the most frequently associated pathology, affecting 28.4% (29/102) of the sample. Outcomes of cases showed that 14.7% (15/102) of the patients died, 22.5% (23/102) were discharged from outpatient care, 12.7% (13/102) discontinued treatment and the remaining cases were in treatment. Women showed a lower relative risk (RR = 6.5) to evolve to an outcome of death in relation to the men. The mean age determined among patients who died was 54 ± 13.8 years-old, with minimum and maximum ages of 28 and 77 years-old, respectively (Table 1).

Place of residence was more frequently registered in the urban area, 52.9% (54/102), 11.8% (12/102) were resident in rural areas and in 35.3% (36/102) of the medical record, no information was recorded.

1. Departamento de Fisioterapia, Laboratório Experimental, Universidade Estadual do Oeste do Paraná, Cascavel, PR. 2. Departamento de Análises Clínicas, Centro de Vigilância Epidemiológica de Foz do Iguaçu, Foz do Iguaçu, PR. 3. Departamento de Farmácia, Laboratório de Análises Clínicas, Ensino, Pesquisa e Extensão, Hospital Universitário do Oeste do Paraná, Universidade Estadual do Oeste do Paraná, Cascavel, PR.

Address to: Dr. Eduardo Alexandre Loth. Deptº Fisioterapia/Lab Experimental/UNOESTE. Caixa Postal 701, Rua Universitária 1.619, Jardim Universitário, 85819-110 Cascavel, PR, Brasil.

Phone: 55 45 3220-3000

e-mail: alexandreloth@hotmail.com

Received in 03/08/2010

Accepted in 17/11/2010

TABLE 1 - Distribution of paracoccidioidomycosis cases according to sex, presence or absence of associated pathologies and number of deaths reported in the medical records.

Associated pathologies	Male	Death	Female	Death	Cases		Death	
					n	%	n	%
Tuberculosis	16	2	8	0	24	23.5	2	13.3
Tuberculosis/HIV	3	2	2	0	5	4.9	2	13.3
Other diseases*	16	3	6	0	24	23.5	3	20.0
No associated pathologies	16	6	8	2	24	23.5	8	53.3
Not included	19	0	6	0	25	24.5		
Total	72	11	30	2	102	100.0	15	100.0

HIV: human immunodeficiency virus. * hepatitis, hypertension, diabetes, heart disease and dementia.

Regarding the clinical forms, 91.1% (93/102) of the sample cases presented the chronic form of the disease, while 8.8% (9/102) of cases presented the acute form. Among those who died, only one did not have the chronic form of the disease. The standard treatment for PCM adopted in the Tuberculosis Division of the Epidemiological Surveillance of *Foz do Iguaçu* is heterogeneous, involving drugs commonly used and reported in the literature.

In this study, about 50 new diagnosed cases of the disease were identified in 2008 alone. In the northwestern region of the State of *Paraná*, 45 cases of PCM were reported over a 10-year period between 1996 and 2006⁷. In the State of Mato Grosso do Sul, 422 cases (22.2 cases/year) of the disease were reported between 1980 and 1999⁸. The high number of new cases per year in this study is due to the fact that mycological examination of sputum for PCM is part of the routine for all the patients attending the Tuberculosis Division of the Epidemiological Surveillance of *Foz do Iguaçu*.

Many studies indicate that the proportion of PCM between the sexes is significantly higher among men, with ratios of 14:1⁷, 10:1⁸ and 27.3:1⁹ reported in the literature. In the present study, a ratio of 2.4:1 was determined, which suggests that women have begun to assume behavior that exposes them to the fungus, such as tobacco use, alcohol and other drugs, and are engaging in activities previously performed by men.

PCM mostly affects men of productive age, between 30 and 59 years-old^{5,10,11}. Similarly, observation verified that the age group 30 to 59 years-old showed high prevalence in this study.

These findings indicate that most patients in the study lived in urban areas. These data are known to differ with the postulates discussed in the literature^{5,10}. News reports indicate the emergence of new epidemiological characteristics for *P. brasiliensis*¹².

It should be noted that the authors of this study do not rule out the possibility that part of the sample simulated residence in urban areas of the City of *Foz do Iguaçu*, hiding their true origin as foreign nationals, believing that this ensures treatment. However, research conducted in Brazil indicates that such patients frequently migrate between Brazil, Paraguay and Argentina, simulating residence in Brazil to obtain healthcare more easily; this masks an important problem in this border region and highlights the pressing need for an epidemiological survey conducted jointly between these countries.

In this study, 52% of the patients presented diseases concomitant with PCM and of these, 28.5% presented tuberculosis. The large number of tuberculosis cases in this study is due to the fact that sampling was performed in an epidemiological center that receives patients with the disease, attending the public healthcare of this region. However, the possibility of an association between these

two diseases, aside from similarities in clinical outcome, cannot be discounted.

For events of deaths among the patients in the sample, a coefficient of 10 deaths per million inhabitants in one year was determined. In the State of *São Paulo*, from 1985 to 2005, lower rates of mortality of 2.28 deaths per 1 million inhabitants were reported¹. In the State of *Paraná*, from 1980 to 1998, an annual mortality rate of 3.48 deaths per million inhabitants was determined, which meant the state was first in PCM mortality in Brazil¹³.

Regarding the patients that died in this study, 46.6% showed some disease concomitant with PCM and tuberculosis the most prevalent, a factor that could be associated with the high rate of deaths observed. These results corroborate other studies that reported the association of TB with PCM^{1,14}.

The data indicate that the microregion bordering the *Itaipu* Lake is an endemic area for PCM and shows high rates of mortality among these patients.

CONFLICT OF INTEREST

The authors declare that there are no conflict of interest.

REFERENCES

- Santo AH. Tendência da mortalidade relacionada à Paracoccidioidomycose, estado de São Paulo, Brasil, 1985 a 2005: estudo usando causas múltiplas de morte. *Rev Panam Salud Publica* 2008; 23:313-324.
- Restrepo A, McEwen JG, Castaneda E. The habitat of *Paracoccidioides brasiliensis*: how far from solving the riddle? *Med Mycol* 2001; 39:233-241.
- Shikanai-Yasuda MA, Telles Filho FQ, Mendes RP, Colombo AL, Moretti ML. Consenso em Paracoccidioidomycose. *Rev Soc Bras Med Trop* 2006; 39: 297-310.
- Franco MF, Montenegro MRG, Mendes RP, Marcos SA, Dillon NL, Mota NGS. Paracoccidioidomycosis: a recently proposed classification of its clinical forms. *Rev Soc Bras Med Trop* 1987; 20:129-132.
- Maluf MLE, Pereira SRC, Takahachi G, Svidzinski TIE. Prevalência de Paracoccidioidomycose-infecção determinada através de teste sorológico em doadores de sangue na região noroeste do Paraná, Brasil. *Rev Soc Bras Med Trop* 2003; 36:11.
- Itaipu Binacional. Relatório de Sustentabilidade da [Internet]. 2008. [cited 2009 Nov 7]. Available from <http://www.itaipu.gov.br/>.
- Gomes E, Ferreira L, Patussi EV, Wingeter MA, Maragon AV, Svidzinski TIE. Perfil Clínico, Laboratorial e Epidemiológico de Pacientes com Paracoccidioidomycose em Um Serviço de Referência no Noroeste do Estado do Paraná. *Cienc Cuid Saude* 2008; 7:53-61.
- Paniago AM, Aguiar JL, Aguiar ES, Cunha RV, Pereira GROL, Londero AT, et al. Paracoccidioidomycosis: a clinical and epidemiological study of 422 cases observed in Mato Grosso do Sul. *Rev Soc Bras Med Trop* 2003; 36:455-459.
- Severo LC, Roesch EW, Oliveira EA, Marineide MR, Londero AT. Paracoccidioidomycosis in women. *Rev Iberoam Micol* 1998; 15:88-89.
- Brummer E, Castaneda E, Restrepo A. Paracoccidioidomycosis: an update. *Rev Clin Microbiol* 1993; 6:89-117.
- Blotta MHSL, Mamoni RL, Oliveira SJ, Nouér SA, Papaiordanou PMO, Goveia A, et al. Endemic regions of Paracoccidioidomycosis in Brazil: a clinical and epidemiologic study of 584 cases in the southeast region. *Am J Trop Med Hyg* 1999; 61:390-394.
- Gontijo CCV, Prado RS, Neiva CLS, Freitas RM, Prado FLS, Pereira ARA, et al. A Paracoccidioidomycose em pacientes atendidos no Hospital das Clínicas da UFMG (HC-UFMG). *Rev Med Minas Gerais* 2002; 13:231-233.
- Bittencourt JIM, Oliveira RM, Coutinho ZF. Paracoccidioidomycosis mortality in the State of Paraná, Brazil, 1980/1998. *Cad Saude Publica* 2005; 21:1856-1864.
- Quagliato Jr R. Grangeia TAG, Massucio RAC, Capitani EM, Rezende SM, Balthazar AB. Associação entre Paracoccidioidomycose e Tuberculose: Realidade e Erro Diagnóstico. *J Bras Pneumol* 2007; 33:295-300.