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Urbanorum Spp: First Report in Brazil

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

BCDFG 1 **Raí Pablo Sousa de Aguiar**
ABCDEF 2 **Lumar Lucena Alves**

1 Master in Biomedical Sciences, Federal University of Piauí – UFPI, Campus
Ministro Reis Veloso, Parnaíba, Piauí, Brazil
2 Biomedical Sciences, Tiradentes University – UNIT, Aracaju, Sergipe, Brazil

Corresponding Author: Lumar L. Alves, e-mail: lumarlucena2@yahoo.com.au
Conflict of interest: None declared

Patient: Female, 41
Final Diagnosis: Presence of *Urbanorum spp* in the stool samples analysed
Symptoms: Abdominal discomfort • diarrhea • fever
Medication: Metronidazole 500–750 mg
Clinical Procedure: Parasitological exam
Specialty: Diagnostics, Laboratory

Objective: Rare disease
Background: The first scientific case related to *Urbanorum spp* protozoan infection was identified in Peru in 1994. Considering there are few cases catalogued, the aim of this study was to register the first case of *Urbanorum spp* infection in Brazil.
Case Report: A thin 41-year-old female patient with dark skin, weighing 55 to 60 kg attended the Buriti Municipal Central Laboratory, in Maranhão, Brazil to undergo routine exams. Among the exams requested was a parasitological exam of feces, which was processed according to the protocol of Hoffman, Pons, and Janer (HPI) or Lutz, an easy, simple, and low-cost parasitological technique. This method consists in spontaneous sedimentation of a filtered homogenate of feces sample and water. The sample was stained with Lugol and examined under light microscopy at 10× and 40×. We detected a light-yellow structure with rounded shape and several filaments similar to pseudopods. The microscopic analysis raised doubts about the identity and pathogenicity of this microorganism.
Conclusions: This study reports the first case of *Urbanorum spp* infection in Brazil, where the current environmental conditions have contributed to new parasitological cases. Therefore, further studies are recommended to identify unknown cases of *Urbanorum spp* infection in other regions of the country to create a national registry related to this new protozoan.

MeSH Keywords: Brazil • Clinical Laboratory Services • Environment and Public Health • Environmental Microbiology • Parasitology

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Background

Enteroparasitosis refers to infections caused by helminths and protozoa, constituting a serious public health problem. It is present in most developing countries and its prevalence reflects the health and socio-economic conditions of a region [1]. The lack of attention to these factors is a determinant of the quality of life of the population, since inappropriate environmental conditions can foster the development of new parasites, affecting the health of local populations.

The first cases of intestinal infections caused by *Urbanorum spp* date from 1991, although the first scientific record was only made in 1994 by Francisco Tirado Santamaria, professor of Parasitology at the Industrial University of Santander [2]. This finding was the result of years of observations in fecal samples from patients treated at the Policlinic de Barrancabermeja, Peru. Parasitological analyzes revealed the presence of a circular-shaped structure with several pseudopods and a light-yellow color when stained by Lugol [3]. Its structure was characterized by the presence of an exoskeleton with double membrane and pores through which the hyaline structures that help in the locomotion of the parasite leave [4]. According to Botero and Restrepo, the reproduction of *Urbanorum spp* occurs by binary division and its life cycle in humans is still unknown. In addition, due to its movement by pseudopods, the new parasite was compared to amoebas, although it presents an unusual size for a protozoan, at 80–100 µ in diameter [5,6].

Urbanorum spp transmission occurs in a similar way to other intestinal parasites, especially through lack of personal hygiene, water, soil, and food contaminated by the protozoan. An acute diarrheal syndrome, with colic and liquid fecal samples, acid pH, without mucus, blood, or leukocytes characterizes the clinical symptoms. These characteristics are due to the parasite's attack on the host's large intestine [7]. For treatment of infected patients, drugs commonly used in cases of amebiasis are recommended, such as Metronidazole and Secnidazole [8,9].

Brazil has high rates of intestinal parasitosis [10], but the present report is the first to document a case of *Urbanorum spp* infection in the country, aiming to alert public health officials and health professionals to inform the population and guide them in prevention efforts. Thus, the objective of this article is to report the first case of parasitic infection in Brazil by an *Urbanorum spp* parasite.

Case Report

Our patient was a thin, 41-year-old woman weighing 55–60 kg, who attended the Buriti Municipal Central Laboratory, in Maranhão, Brazil on October 18th of 2017 to undergo routine

exams requested after a medical appointment. It was her first time at the laboratory after the Family Health Team had oriented her, which contributed to her first clinical records. The patient reported that she lives in a rural area, where the lack of sanitation is a current social problem and access to potable and chlorinated water is difficult. She was an agricultural worker harvesting corn and sugarcane. After one of her trips to work, she reported she felt unwell and started to complain about fever and constant abdominal colic. Then, she drank a homemade herbal tea, but the symptoms remained. A few days later, she had diarrhea and abdominal pains for a week, for which she sought medical help. Because she lives in a rural area, she was assisted by the Family Health Team, which diagnosed her with acute diarrhea based on her symptomatology, and requested lab tests to investigate the cause.

Among the exams requested was a parasitological fecal exam; the samples were liquid, which is a common feature of diarrhea. The fecal samples were processed according to the protocol of Hoffman, Pons, and Janer (HPI) or Lutz, an easy, simple, and low-cost parasitological technique [11]. This method uses spontaneous sedimentation of a filtered homogenate of fecal sample and water as a homogenization solution. To obtain a more reliable result, 3 slides (coverslip 24×32 mm) from the sample were stained with Lugol and examined on the same day by the same examiner under light microscopy using 10× and 40× objectives. A laboratory technician, who has worked for 20 years at the laboratory, performed the staining, while a trained parasitologist did the reading and identification of the parasite.

The samples analyzed lacked red blood cells, leucocytes, and mucus, but contained a structure with rounded shape and several filaments resembling pseudopods. The staining process used Lugol's iodine solution, which is commonly used in concentration techniques for the detection of intestinal protozoa (Figure 1). In addition, the microscopic analysis of the pathogen raised doubts about the identity of this microorganism and its pathogenicity, considering it was the first case report of this parasite in Brazil. Then, to answer these questions, several studies were done to find references about the new microorganism in the literature. The results were based not only on the symptomatology of the patient, but also on a few references about the parasite life cycle and its morphological features, which confirmed that the microorganism was a parasite known as *Urbanorum spp*, first identified in the 1990s.

The protozoon had not been previously encountered by the Family Health Team, and it was a challenge to discover the best treatment for the patient. Then, considering the morphological similarity of the parasite to an *Entamoeba*, Metronidazole 500–750 mg PO q8hr for 5 to 10 days was prescribed. After 14 days of treatment, the Family Health Team reported the patient had improved clinical status.

Figure 1. *Urbanorum* spp stained with Lugol, highlighting its shape, light-yellow color, and morphology under light microscopy.

This report has several limitations. First, it was not possible to follow the patient after treatment because she did not return to repeat the parasitological tests after she felt better. Second, we lacked previous clinical records of the patient because this was her first visit to the laboratory for routine exams. Third, the lack of Brazilian references prevents this case from being compared with other regional cases to evaluate and compare different environmental influences on parasite adaptation. However, these limitations did not affect the identification of the *Urbanorum* spp parasite, which it is still important.

Discussion

This is the first case report of *Urbanorum* spp in Brazil, a country that has favorable environmental conditions for the appearance of new cases of intestinal parasitosis. However, this is not the first reported case in South America, since it has already been identified in countries with similar environmental conditions, including Colombia, Peru, and Ecuador [6,5,12]. The structure we found had the same morphological features reported by other authors [2,13], suggesting the recent introduction of this protozoan in Brazil.

Despite the limited literature on *Urbanorum* spp, scientific studies have shown the occurrence of this parasite over the years, showing it is present in the midst of many other intestinal parasites. In 1994, Santamaria analyzed 283 samples, of which 16.6% contained this protozoan. Two years later new analyzes were carried out on 143 samples, of which approximately 14% contained *Urbanorum* spp. In 1997 and 1998, a larger study was done by the same researcher, reporting that of 14 000 fecal samples, 10% contained this parasite. Eight years later, in Barrancabermeja, Colombia, 500 parasitological samples of school-age children were investigated and 10% were positive for *Urbanorum* spp, as well as 5% of a total of 200 samples analyzed in Santander, Colombia [2]. These data serve as an epidemiological record about the new parasite, which despite its decrease in the number of cases diagnosed over time, has been present in several laboratory analyses [14].

A study conducted by Morales Del Pino in Cajamarca, Peru, showed through the Graham and HPJ test that 20.8% of children ages 3–14 years had *Urbanorum* spp from a total of 96 children in primary and secondary schools. The sanitary, environmental, economic, and socio-cultural conditions were taken into account, which showed that these factors directly

affect the epidemiology of this parasite [7]. In a similar work, Leandro reported the prevalence of helminths and protozoa in 3 different regions of Ecuador, and found in 295 fecal samples, several types of parasites were identified by the direct test and the Ritchie method, including *Urbanorum spp.*, which had a prevalence rate of 1.16% in one of the regions [11]. Both studies made use of different parasitological techniques, and one of the techniques was used in the present work and efficiently identified *Urbanorum spp.* In addition, the parasite can be found in several different environments and children are the most common host.

On the other hand, the discovery of this new parasite has caused discussions in the scientific community. According to Rivero, the hyaline structures identified by Professor Tirado refer to adipose cells that, when broken, release mobile filaments, although they do not allow an effective displacement [4]. This same author suggests the need for more scientific evidence and controlled clinical studies to determine the clinical relationship between the host and the microorganism before identifying it as a new parasite. In agreement with the previous author, Silva-Díaz supports the idea that studies are necessary to prove the biological status of *Urbanorum spp.*, since there is no scientific report about it. In addition, the taxonomic classification needs greater scientific rigor, reaffirming the need for further scientific investigations such as *in vitro* parasitological culture, molecular analyses, and transmission electron microscopy [8].

Conclusions

The presence of *Urbanorum spp.* in Brazil is a new and debated scientific finding. Although there are a few studies reporting

its prevalence, which were based on its morphological features, more specific analysis is still necessary to confirm its existence. Nevertheless, we must ensure the registration of this parasite since the discovery of new protozoans in countries like Brazil is a common due to favorable conditions for their development.

Here, we reported the first case of *Urbanorum spp.* in Brazil, where the current environmental conditions have contributed to new parasitological cases. Therefore, it is important to continue investigating further symptomatic individuals, as this study has indicated the presence of a new parasite in the country.

Despite the limitations of this study, it advances scientific understanding of the prophylaxis, risks, and treatment methods for *Urbanorum spp.* Our report also allows comparison with others cases to evaluate the parasite-host interaction and further understand its pathogenicity.

In conclusion, our report presents relevant points regarding *Urbanorum spp.*, and encourages the discovery of new methods for its identification and diagnosis beyond microscopic analysis. Finally, new studies are recommended to identify unknown cases of *Urbanorum spp.* in other regions of Brazil to create a national registry related to this new protozoan, which could serve as a fundamental record and reference for new case reports.

Conflicts of interest

None.

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