Blastocystis spp infections among inhabitants of a low income community of Niterói, Rio de Janeiro, Brazil.

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Introduction: *Blastocystis* spp is an anaerobic enteric protozoan food-borne parasite that remains, until nowadays, subject of controversy. In fact, little is known about its pathogenic potential, genetic diversity, host-parasite interactions and treatment (Kaya *et al*.; 2007; Tan, 2008). Actually, it is the most frequently found enteroparasite in coproparasitological research and have been implicated in affections such as irritable bowel syndrome, but epidemiological studies are inconclusive (Nagel *et al*.; 2015). Indeed, some studies have inferred the existence of prevalence rates around 50% in developing countries, while in drops to 1.5-10% in developed world. These high taxa in developing countries is due, mainly, to precarious living conditions and social and economical factors suggesting that transmission increases in communities where basic sanitation is scarce, continuous use of sources of untreated water and contact with domestic animals. Infections by *Blastocystis* spp are detected in faecal samples from assymtomatic and symptomatic individuals and in some epidemiological studies, infected people report abdominal pain, diarrhoea, nausea, vomitus, bloating, anorexia and dermatological manifestations (Kurt *et al*.; 2016).

The protozoan is pleomorphic and at least four different forms have been reported and described (Tan, 2008). Besides, some advances on the biology of the parasite have been achieved as molecular studies based on polimerase chain reaction (PCR) showed that it has – until now – 17 different subtypes and nine of them able to cause human infection. However, despite *Blastocystis* spp isolates from humans and animals have been reported to be morphologically similar, human beings are frequently infected by subtypes ST1- ST9 (Tan, 2008; Sandpool *et al*.; 2017).

The parasite can be detected through coproparasitological techniques and is very common in fresh faecal samples from inhabitants of low income communities.

Objective: This study is part of a project designed to obtain additional data on prevalence and the impact of *Blastocystis* spp infections among inhabitants of low income communities of Niteroi municipality.

Methods: The study was carried out in a community placed in a very poor neighbourhood of Niterói municipality, Rio de Janeiro. In this place, there is an assistencial institution kept by the catholic church which maintain 100 children with average age of 0-10 years old awaiting for adoption. As the staff authorized the research, some measures were taken, such as lectures to children and employees related to hygiene and techniques of food sanitization and transmission of infections by parasites. Subsequently, the staff was instructed to collect fresh fecal samples without preservative substances from the children and keep it refrigerated until its collection. The same instructions were given to all individuals from the surrounding community interested in take part of the study. The samples were concentrated through Hoffmann, Pons&Janner technique (1934) and a report with the results of coproscopy was delivered to the Instituion staff that took necessary actions in order to provide treatment to infected children whenever necessary. The work was approved by an Ethical Comitee from Medical School of Universidade Federal Fluminense, Protocol n^{0} 112/11.

Statistical analysis was performed by using the software GraphPadPrism 7.0 (www.graphPad.com) and data was evaluated through Fisher and Chi-square Tests. Results were considered significative by taking a significance level of 0.05.

Results

A total of 78 faecal samples were obtained and 52 from children who agreed to take part in the study and 26 adults from staff of the orphanage. Enteroparasites infections were detected through the coproparasitological technique employed in high prevalence rates (**Table 1**), but they were more frequently found among children, although no statistical significance had been found **(p=0,3)**.

Table 1. Enteroparasites infections detected through Hoffmann, Pons & Janner technique in fecal samples from volunteers of a catholic institution at Niterói, RJ (2018).

Studied groups	n	np	P
Children	52	35	67
Staff	26	12	46
Total	78	47	60

n = total; np = total of positive samples; P = Prevalence (%); p>0,05

Table 2. Prevalence rates by species of protozoan enteroparasites found through Hoffmann, Pons & Janner technique in fecal samples from volunteers of a catholic institution at Niterói, RJ (2018).

Protozoan species	***p/n***	***P(%)***
Blastocystis spp	32/78	41
Endolimax nana	15/78	19
Giardia lamblia	9/78	11

Entamoeba histolytica/dispar	7/78	9
Entamoeba coli	5/78	6.4

p = total of positive samples according to parasite species; **n**= total; **P** = Prevalence (%)

The protozoan parasite *Blastocystis* spp was found in 41% of the samples and it was the most prevalent among the positive ones (68%) followed by the non pathogenic *Endolimax nana* - found in 19 % of the samples and 32% of positive samples (**Table 2**). Other protozoan species such as *Giardia lamblia*, *Entamoeba histolytica*/*E. dispar* and *E. coli* were also found in a lesser proportion. It was possible to note that protozoan infections in general were more common than those caused by helminths, and very few cases of cestodes infections such as *Taenia* sp and *Hymenolepis nana* were found. Infections by nematodes species such as *Enterobius vermicularis* and *Strongyloides stercoralis* were also detected (data not shown).

Discussion

Blastocystis spp is an extremely ubiquitous parasite with a worldwide distribution and is often the most commonly isolated organism in parasitological surveys. Besides, is not uncommon to be the most frequently isolated parasite in epidemiological surveys (Tan, 2009). There is a remarkable fluctuation in prevalence rates in different countries and within various regions in the same country. In fact, prevalence rates are higher in poor regions of developing countries than in the more developed and rich ones. It seems that risk factors are associated to poor hygiene, living together or very close to animals and consumption of contaminated food or water. The results presented here are consistent to other coproparasitological studies performed in communities from Rio de Janeiro which have showed high prevalence rates of *Blastocystis* spp infection – 31-38% (Silva-Neto *et al*.; 2010) and 70% (Silva, 2006) or 49% in other regions from Brazil (Minuzzi & Cuba, 2010).

It is a general consensus that transmission of *Blastocystis* spp is by fecal-oral route (Barak *et al*.; 2014). The Institution where the collection of fecal samples was carried out has a good pattern of hygiene and in individual care of the children. There was a routine in sanitization of vegetables and fruits, and all meat served was well cooked. One possibility is that infection may occur outside the institution or in recreational areas of it. Recently, a dog was introduced at the place as a gift to the children and if it acts as a reservoir, is unknown. Although in this study only a small sample was obtained, it reflects, somehow, that this protozoan has become very common and it is unknown what it does really represents. The high prevalence rates of it may mean that we are dealing with a parasite that suffered selective pressure by the indiscriminate use of anti helminth drugs?

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